# MARINE REVIEW

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### LAKE SHIP YARDS ARE FILLING UP.

Ship building companies of the great lakes that build steel vessels already have under contract for next season twelve steel vessels, eight of which are modern freight carriers, two passenger boats, one an oil tank barge, and one a large tug. These vessels will foot up in value a little more than $2,000,000. The combined capacity of the eight freight carriers will be about 59,000 net tons. In addition to these steel ships it is announced that James Davidson, of West Bay City, will build at least two large wooden freighters, and there is a probability also of a few wooden vessels of the medium class being built at other points around the lakes. Orders thus far placed are divided among the different builders as follows:

Chicago Ship Building Co., Chicago—Steel screw passenger and freight steamer for Northern Michigan Transportation Co., of Chicago; steel freight steamer and steel tow barge, each of about 8,000 net tons capacity, for Minnesota Steamship Co.

Globe Iron Works Co., Cleveland—Steel freight steamer, a duplicate of the Morse, largest ship on the lakes, for Bessemer Steamship Co.; steel freight steamer, also of modern type, for John Mitchell and others of Cleveland.

Detroit Dry Dock Co., Detroit, Mich.—Steel side-wheel passenger steamer for service between Erie and Buffalo; steel tug for army engineer service on Puget sound.

Cleveland Ship Building Co., Cleveland—Two steel steamers, both of modern type, for A. B. Wolvin, of Duluth, and Capt. Thomas Wilson, of Cleveland.

American Steel Barge Co., West Superior, Wis.—Steel tow barge of about 8,000 net tons capacity, for Bessemer Steamship Co.; steel oil tank barge for Standard Oil Co.

Craig Ship Building Co., Toledo, O.—Steel freight steamer of Welland canal dimensions, on builders' account.

James Davidson, West Bay City Mich.—Two wooden schooners of about 4,500 net tons capacity each.

There is still, of course, room for more new keels in the steel yards, although probably not for delivery until August of next year, unless in the case of the Detroit Dry Dock Co., which has no big orders as yet, or the Union Dry Dock Co., of Buffalo, which has not, as far as can be learned, booked any new work. Considerable figuring is still going on for new vessels in all parts of the lakes. The Union Transit Co., of Buffalo, has asked for proposals on a steel steamer for package freight business, to take the place of the Moran, sold recently to the Crosby Transportation Co., of Milwaukee, for a winter boat in Lake Michigan service. The new steamer will not be much over 300 feet long, as it is figured that such a vessel would handle easily, and would not require a great deal of towing in port, which is a feature of special advantage in the package freight trade. Owners of the steamer Nicholas, of Cleveland—Minch estate and others—are also negotiating for a new steamer.

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It is understood that as a result of the large amount of work again under contract at the works of the Chicago Ship Building Co., the engine works of that concern will very probably be doubled in size. The engine works of the Chicago—an excellent shop with the very latest tools—has been in operation night and day ever since it was built. The two vessels to be built at Chicago for Pickands, Mather & Co., of Cleveland, representing the Minnesota Steamship Co., are to be out in June and July next. The steamer is to be 430 feet keel, 50 feet beam, and 28½ feet depth, and the barge of the same breadth and depth, but of 436 feet keel. The steamer will therefore be about the size of the Superior City, and the barge about the size of the Fritz and Roebling, of the Bessemer fleet. It has not been decided as yet whether this new Minnesota steamer will have quadruple expansion engines and water-tube boilers, or only triple engines and Scotch boilers.

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Proceedings against the two ore railways of Minnesota for a reduction in rates, which excited a great deal of attention in iron ore circles a few months ago, on account of the Rockefeller interest and the Minnesota Iron Co. having a monopoly of the business on the Vermillion and Mesabi ranges, have been dropped entirely. Messrs. J. G. Brown, and William J. Conan, who were the leading petitioners before the board of railroad and warehouse commissioners of Minnesota in this matter, say they have dropped the case on account of the protracted and expensive character of the proceedings and the apparent indifference of land owners generally who would be equally interested with them in the outcome. The interest of the Oliver Mining Co. on the Vermillion range, with three big mines and a probable output next year of 600,000 tons, is now very large, but it is probable that their influence will be such as to bring about a settlement with the railways without resorting to legal action.

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The same complaint is heard from vessel masters of the lakes again this fall about buoys and lights being removed or extinguished earlier than is necessary by officials of the U. S. light house service. "If district officers of the light house service were allowed to remain long enough on the lakes to become fully acquainted with the conditions," says a leading vessel owner, "we would not have so much of this trouble. The vessel interests are certainly at a disadvantage in some respects on account of these frequent changes among inspectors. There certainly seems to be no good excuse for removing the men from Stannard rock, Lake Superior, for instance, on Nov. 18, when vessels are still running up and down Lake Superior in great numbers, and may continue to run there until the middle of December. A tug could run out from Marquette and take the men from Stannard rock light at any time up to the closing of the canal at Sault Ste Marie."

### A VIEW OF THE CLOSING LAKE SEASON.

In the closing days of a long season of navigation—long on account of a very early opening—interest is, of course, attached to the outlook for another year. For the first time in a great many years the ship yards will be unable to deliver in the spring new vessels equal to the combined capacity of ships lost in storms and those transferred to the Atlantic coast by charter. The number of vessels totally lost in severe gales, by collision, etc., is much larger than for many years past. The losses of all kinds have, in fact, been so heavy, that new forms of policy, decidedly unfavorable to the vessels, are already proposed on a few wooden ships whose insurance expired before the close of navigation. Rates will certainly be higher on all vessels, and it is more than probable that a very large number of the medium class of ships will be shut out entirely from insurance next year, the owners taking chances of loss in preference to paying high rates and accepting the kind of policy that will be offered to them. But as against this unfavorable feature of the situation, and notwithstanding the fact that the entire volume of business of the lakes this year will exceed any previous record by three or four million tons, it will be admitted that the outlook for another year is decidedly encouraging. Some 59,000 tons of capacity in freight vessels already under contract in lake ship yards will be out early in the spring, but as already noted, this will not be more than equal to the capacity of ships removed from further competition in the general trade. More contracts for new ships will undoubtedly be placed, but in all such cases delivery will be very late in 1899. With each week of late the outlook in iron and steel lines grows more promising. The sale of about 500 000 tons of steel rails within the past few days, based on an agreement between manufacturers involving reasonable prices, is a feature of special importance in the steel trade. For several weeks past the dock managers at Lake Erie ports have been unable to secure more than half the number of cars required to take care of shipping orders from the furnaces. Buffalo's receipts of grain and flour combined for the full season (flour is somewhat short of last year) will be in excess of all previous years, but the increase is entirely in receipts from Chicago, indicating that a combination of circumstances has acted against the Duluth grain movement, and that more business than usual may be expected from the head of the lakes in the early part of next year. Prices of iron ore will undoubtedly be somewhat higher, if from no other cause than the scarcity of labor and higher wages in the mining region. The vessel interests must share in some part of this improvement, although the big companies with iron ore connections, and with facilities for taking care of an enormous business, will, of course, set a pace, when freight contracts are made during the winter, much lower than would be thought of in the days of dollar ore from Lake Superior.

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### STEAMER FOR OLD DOMINION CO.

President H. A. Bourne of the Old Dominion Steamship Co., New York, writes the Review that details have not yet been perfected relative to the steamer Western Shore, for which a contract has been let to the W. & A. Fletcher Co., of Hoboken, N. J. He says, however, that the steamer will be a first-class, side-wheel (feathering buckets) steamer, fitted for a day passenger and freight route. She will be 180 feet on water line, 28 feet 6 inches beam, and 11 feet 6 inches depth from base line. She will have a beam engine, diameter of cylinder 42 inches by 9 feet stroke, and is to have a guaranteed speed of 18 miles an hour. Her main joiner deck will extend from stem to stern, with fine passenger saloon above, with necessary retiring, smoking and toilet rooms. It is expected that the steamer will be finished in April.

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### TONNAGE OF NEW SHIPS.

Particulars of new vessels of over 100 tons registered by the bureau of navigation, treasury department, during the week ending Nov. 19 are as follows: Steam—Admiral Sampson, 2,104 tons gross, 1,335 net, built at Philadelphia; America, 427 gross, 399 net, Jeffersonville, Ind.; John Cudahy, 819 gross, 481 net, Unalaska, Aka,; Louise, 717 gross, 451 net, Unalaska, Aka.; National, 157 gross, 84 net, Philadelphia; O. L. Hallenbeck, 198 gross, 134 net, Philadelphia; Vienna, 176 gross, 176 net, Columbus, Miss. Unrigged—N. A. T. & T. Co. No. 3, 120 gross, 120 net, St. Michael, Aka.

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An idea of the enormous traffic passing up and down the Detroit river opposite the city of Detroit, which is the busiest spot on the whole chain of lakes, may be gained from reports of the river mail service, established over three years ago. Postmaster Dickerson, of Detroit, announces that the business of the marine postoffice this year is more than 100 per cent. greater than that of last year. Last year there were handled approximately 240,000 pieces of mail on the river. This year to Nov. 20, with three or four weeks of navigation still to hear from, the figures were 487,300. The business is increasing so that a second small steam vessel will undoubtedly be required for the service before another season is at an end.

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The report of Secretary Long of the navy, extracts from which are printed elsewhere in this issue, shows that the government paid $18,086,850 for 102 vessels purchased during the war for the auxiliary naval fleet. A full list of the vessels, together with prices paid for them and names of parties from whom they were purchased, is reprinted from the secretary's report.

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A rumor is in circulation to the effect that the Brazilian government may contract in this country for two armored cruisers to replace the Admiral Abronell and Amazonas, contracted for at a British yard and afterward sold to this country at the outbreak of the war with Spain.

## SUPREME COURT DECISIONS.

TWO ADMIRALTY CASES OF SPECIAL INTEREST--LOSS BY PERIL OF THE SEA—ANOTHER RULING REGARDING THE HARTER ACT.

The supreme court of the United States was again called upon in the G. R. Booth case, decided recently, to determine what is a loss by peril of the sea or accident of navigation within bill of lading exceptions, that the carrier shall not be liable for losses occasioned by such perils. The large steel steamer G. R. Booth was discharging at her dock in New York a general cargo, which included twenty cases of detonators. A case of detonators exploded in handling, and blew a hole in the side of the steamer, through which water entered and damaged a part of the cargo. There was no negligence in transporting, storing or handling the detonators.

The question submitted to the court was "Whether the damage to libellant's sugar caused by the sea water which entered the ship through the hole made in her side by the explosion, without her fault, is a 'loss or damage occasioned by the perils of the sea or other waters,' or by an 'accident of navigation of whatever kind,' within the above-mentioned exceptions in the bill of lading."

After a somewhat extended consideration of previous rulings of the court touching the same general question on varying facts and fixing the rule that to the predominant cause the loss must be attributed, and that that cause must rank as predominant which set the other in motion and gave to it its efficiency for harm at the time of the disaster, the court held that the loss was not within the exceptions, saying:

"The damage to the sugar was an effect which proceeded inevitably, and of absolute necessity, from the explosion, and must therefore be ascribed to that cause. The explosion concurred, as the efficient agent, with the water, at the instant when the water entered the ship. The inflow of water, seeking a level by the mere force of gravitation, was not a new and independent cause, but was a necessary and instantaneous result and effect of the bursting open of the ship's side by the explosion. There being two concurrent causes of the damage—the explosion of the detonators and the inflow of water—without any appreciable interval of time, or any possibility of distinguishing the amount of damage done by each, the explosion, as the cause which set the water in motion and gave it its efficiency for harm at the time of the disaster, must be regarded as the predominant cause. It was the primary and efficient cause, the one that necessarily set the force of water in operation; it was the superior or controlling agency, of which the water was the incident or instrument. The inflow of the sea water was not an intermediate cause, disconnected from the primary cause, and self-operating; it was not a new and independent cause of damage; but, on the contrary, it was an incident, a necessary incident and consequence, of the explosion; and it was one of a continuous chain of events brought into being by the explosion—events so linked together as to form one continuous whole. The damage was not owing to any violent action of winds or waves, or to the ship coming against a rock or shoal or other external object; but it was owing to an explosion within the ship, and arising out of the nature of the cargo, which cannot be considered, either in common understanding or according to the judicial precedents, as a peril of the sea."

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Another case passed upon by the supreme court recently is the Silvia, decided October 17, 1898. The steamer Silvia, with sugar in lower hold, and spare rails, ropes and a small quantity of stores between decks, which had been fitted to carry steerage passengers, sailed from Matanzas for Philadelphia. In the between decks compartment, next to the forecastle and about 9 feet above water line, when deep laden, were four 8-inch port holes furnished with 5/8-inch glass covers and an inner iron cover. At sailing only the glass covers were on, hatches were battened, but could be opened in two minutes. The weather was fair at sailing, but during the afternoon of the same day rough weather was encountered and the glass cover to one port broken, whether by the sea, floating timber or wreckage was a matter of conjecture. Water entered by the broken port and damaged the cargo. In a previous case the court had determined that the Harter act does not relieve the owner from having his vessel seaworthy at the beginning of the voyage, and in this case it was contended that the Silvia was unseaworthy at the time of sailing. The court said:

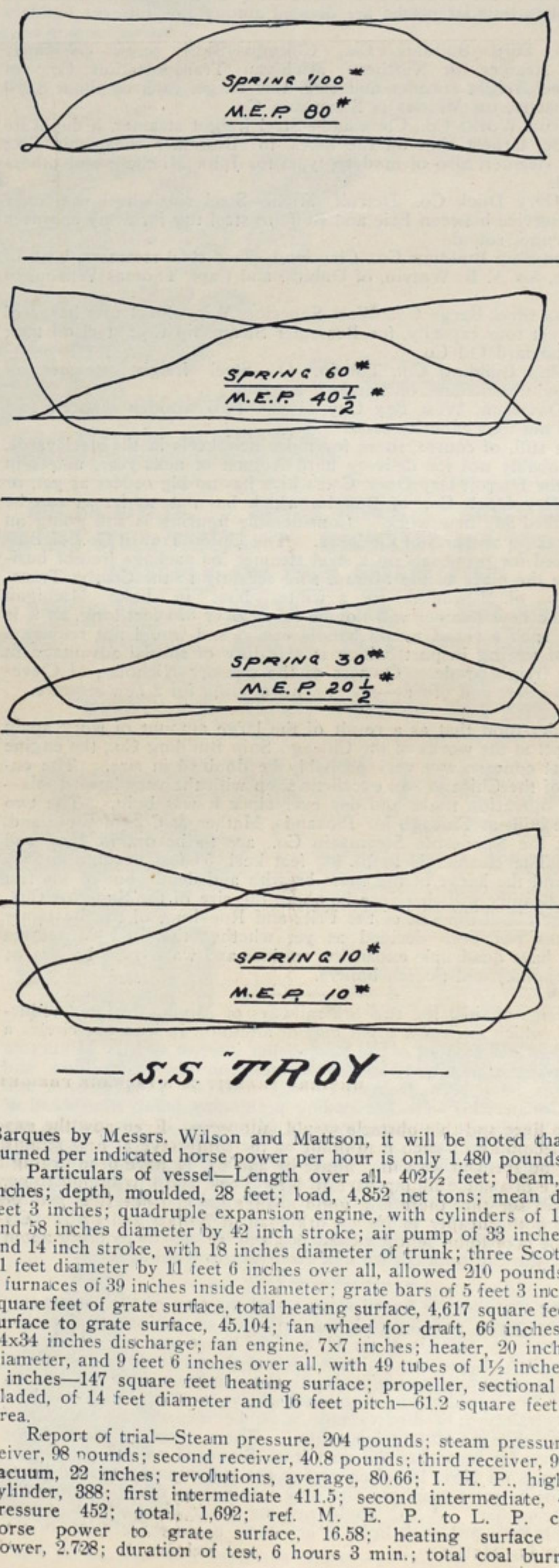
"The test of seaworthiness is whether the vessel is reasonably fit to carry the cargo which she has undertaken to transport. The port holes of the compartment in question were furnished both with the usual glass covers and with the usual iron shutters or deadlights, and there is nothing in the case to justify an inference that there was any defect in the construction of either. When she began her voyage, the weather being fair, the glass covers only were shut, and the iron ones were left open for the purpose of lighting the compartment. Although the hatches were battened down, they could have been taken off in two minutes, and no cargo was stowed against the ports so as to prevent or embarrass access to them in case a change of weather should make it necessary or proper to close the iron shutters. Had the cargo been so stowed as to require much time and labor to shift or remove it in order to get at the ports, the fact that the iron shutters were left open at the beginning of the voyage might have rendered the ship unseaworthy. But as no cargo was so stowed, and the ports were in a place where these shutters would usually be left open for the admission of light, and could be easily got at and closed if occasion should require, there is no ground for holding that the ship was unseaworthy at the time of sailing.

This case does not require a comprehensive definition of the words 'navigation' and 'management' of a vessel within the meaning of the act of congress. They might not include a stowage of cargo not affecting the fitness of the ship to carry her cargo. But they do include, at least, the control, during the voyage, of everything with which the vessel is equipped for the purpose of protecting her and her cargo against the inroad of the seas; and if there was any neglect in not closing the iron covers of the ports, it was a fault or error in the navigation or in the management of the ship."

## PACKAGE FREIGHT STEAMER TROY.

TRIAL OF A LAKE-FREIGHTER THAT BURNS LESS THAN 1½ POUNDS OF COAL PER INDICATED HORSE POWER PER HOUR.

There is presented herewith a picture of the steamer Troy, built recently by the Detroit Dry Dock Co., Detroit, Mich., for the Western Transit Co., which is the lake line of the New York Central Railroad. The Troy is certainly a representative package freight steamer of the lakes, as she can stow away enough flour to give her a full cargo at the present draught to Lake Superior, and she has hoisting apparatus capable of discharging her entire cargo in ten hours. She holds the record in the flour trade—48,500 barrels. It is claimed for her that she can move 5,050 tons of freight at 13 miles speed with less power than any other ship on the lakes. Success with this vessel as regards fuel economy is attributed largely by her builders to the use of Howden hot draft. In the following particulars of a trial made October 19 between Detour and Point au




Barques by Messrs. Wilson and Mattson, it will be noted that the coal burned per indicated horse power per hour is only 1.480 pounds.

Particulars of vessel—Length over all, 402½ feet; beam, 45 feet 6 inches; depth, moulded, 28 feet; load, 4,852 net tons; mean draught, 17 feet 3 inches; quadruple expansion engine, with cylinders of 19, 27½, 40 and 58 inches diameter by 42 inch stroke; air pump of 33 inches diameter and 14 inch stroke, with 18 inches diameter of trunk; three Scotch boilers, 11 feet diameter by 11 feet 6 inches over all, allowed 210 pounds pressure; 6 furnaces of 39 inches inside diameter; grate bars of 5 feet 3 inches—102⅜ square feet of grate surface, total heating surface, 4,617 square feet; heating surface to grate surface, 45.104; fan wheel for draft, 66 inches diameter, 34x34 inches discharge; fan engine, 7x7 inches; heater, 20 inches outside diameter, and 9 feet 6 inches over all, with 49 tubes of 1½ inches by 7 feet 8 inches—147 square feet heating surface; propeller, sectional and four-bladed, of 14 feet diameter and 16 feet pitch—61.2 square feet expanded area.

Report of trial—Steam pressure, 204 pounds; steam pressure, first receiver, 98 pounds; second receiver, 40.8 pounds; third receiver, 9.5 pounds; vacuum, 22 inches; revolutions, average, 80.66; I. H. P., high pressure cylinder, 388; first intermediate 411.5; second intermediate, 440.5; low pressure 452; total, 1,692; ref. M. E. P. to L. P. cyl., 37.44; horse power to grate surface, 16.58; heating surface to horse power, 2.728; duration of test, 6 hours 3 min.; total coal burned, 15,250

pounds; coal burned per hour, 2,520 pounds; coal burned per hour per I. H. P., 1.489 pounds; coal burned per hour per square foot of grate, 24.7 pounds; air pressure at fan, 2 inches; temperature of hot air at furnace, 190°; temperature of hot well, 135°; temperature of feed water after leaving heater, 170°; speed of vessel, 13.25 miles; speed of propeller, 14.66 miles; slip of propeller, 9⅝ per cent.; weather, stiff head wind.

### SHIPS ARE WANTING.

"There is only one thing wanting: regular lines of steamships to various parts of the world," says Andrew Carnegie in referring to obstacles in the way of further development of our export trade in iron and steel. "We can never hope to have such facilities as Britain" he continued, "because Britain imports so much of bulky goods from various parts of the world which we fortunately grow at home. Therefore, Britain's ships get return cargoes, and the rates will be cheaper. But even this disadvantage we can overcome in the lower cost of our manufactures. If we could restore to the United States its rightful position as the ship builder of the world our attention would soon be directed to the establishing of regular steamship lines and this obstacle would fade away. Even now the export trade is becoming of such magnitude as to justify several new steamship lines, as you see, and we will conquer by and by. I have been urging the importance of a shipbuilding yard in New York, and it is bound to come. Capital will see that there is a good chance for it, since steel and wood work are both cheaper in New York than in Belfast and on the Clyde. It will not take long before capital is attracted. I am not interested in this proposed shipyard. I am not engaged in anything but the business of the Carnegie Steel Co., Limited, but I have been consulted by a leading shipbuilding firm in Britain upon the subject, and have given my opinion. Of course our present ship yards being prosperous will extend, but there is plenty of room for a good shipyard in New York. It is rather humiliating to see the St. Paul and the St. Louis, the New York and the Paris following each other to Southampton to be docked there, there being no dock in the great port of New York capable of holding these small ships Yes, small ships. I came over in the Kaiser Friedrich, 'made in Germany.' After you travel on a ship like that you can never think of anything else. We had a rough passage, the roughest I have ever known, and yet the most comfortable."

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The battleship Formidable, one of the largest in the world, was launched last week at Portsmouth, Eng. She is 400 feet over all, 75 feet beam, 26 feet draught, 15,000 tons displacement, cost $5,000,000, and will steam 18 knots.

### WHERE THE SMALL VESSELS ARE MISSED.

Buffalo, Nov. 29.—It may need an object lesson to bring us to a plain realization of the loss to the carrying capacity of the lake fleet sustained by the departure of the middle-sized vessels to salt water, and here we have it: The manager of the Tonawanda Iron & Steel Co. says that of forty-three vessels in a more or less complete list of these emigrants which he had seen, forty-one had been to his furnace with ore this season. The result of their departure before the end of the season is not so very pleasant to the furnace company, for it now finds itself short of stock, and obliged to bring in more ore by rail from Buffalo or other sources of supply, before the lakes can be opened in the spring. Had such a condition of things been suggested in the midst of the stagnant season the past summer, how many people would have believed it possible? High fall rates on ore have in part contributed to the shortage, but a single load each from the salt-water fleet would have made quite a difference with the stock of ore at Tonawanda. The company also has a furnace at Punxsutawney, in the soft coal region of Pennsylvania tributary to Buffalo, and this is short too. It was the intention of laying down enough ore to last well into the summer, but it will not last anything like that time, according to present calculations.

As to what our ore consumers in shallow harbors are going to do under the circumstances, there is no doubt that they can handle larger vessels than they have been doing. They merely took the size they did because it came to them. The obligation appears to have been on the vessels rather than on the ore men. Just how much larger sizes can be utilized remains to be seen, though it is not denied that the Niagara is deeper than the Welland canal, the only thing against it being its current.

Buffalo is in some trepidation lest the iron ores from Cuba come in again soon, as they did in the days of free ores, and supply the eastern furnaces and drive this port out of the ore handling business. As it is, the business shows a fair growth. The amount handled this season will come close to 1,000,000 tons. Had the Minnesota dock been rebuilt before the opening of the season the million mark would have been passed. There is some disappointment over the slow progress of the second blast furnace on Buffalo creek. It was to have been done this season, but it is said that it may be well into next before it can blow in.

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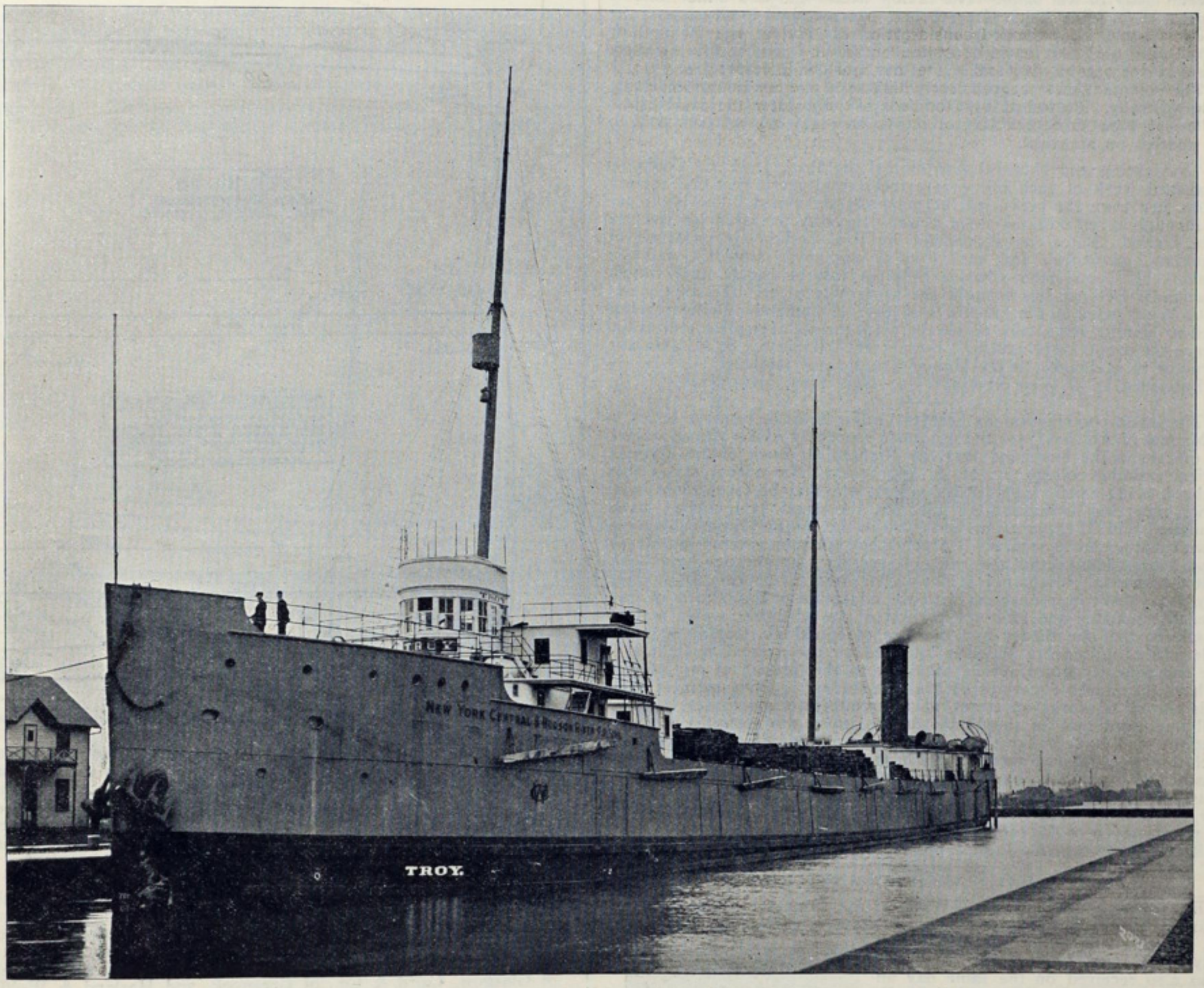
Dec. 10 is the date fixed by Superintendent of Public Works G. W. Aldridge for the closing of New York state canals.




WESTERN TRANSIT CO.'S PACKAGE FREIGHT STEAMER TROY, BUILT BY THE DETROIT DRY DOCK CO.

## SOME NEW BOOKS.

One of the most magnificent books of the year is "Military Europe" by Gen. Nelson A. Miles, U. S. A. It will readily be appreciated that no one is better qualified to make such a book interesting. Gen. Miles has more than justified expectations. Naval officers and persons identified with the shipping interests generally will be especially interested in his description of the naval review in England in June, 1897, in connection with the queen's jubilee. In opening this portion of the subject he says: "The sea power of England is today the bulwark and salvation of the British empire. By that power it is enabled to hold its own provinces and to exert the most powerful influence in the politics of the world. The English are not only proud of their present sea power, but they glory in the events of the past, and they justly felt that a review of their fleet would be one of the significant and splendid features of the jubilee ceremonies. To carry out their plan they assembled off Spithead in the English channel 168 vessels of the British navy, manned by 38,000 men, the most powerful and effective fleet that ever floated upon the waters of the earth. The most wonderful fact about the review was that not a single vessel from the Mediterranean, Asiatic or Pacific squadrons was drawn to make up this powerful body of war-ships. The review fleet was but a minor part of the great naval force which Great Britain has scattered in all parts of the globe. British fleet entire at the time of the review was manned by 100,000 men, and cost upwards of $400,000,000. It is the one effective safeguard not only of England, but of her worldwide colonies.

The volume is most magnificiently illustrated and is a marvel of beauty typographically. Published by Doubleday & McClure Co.,141-155 East 25th street, New York, at $1.50, or the volume will be sent post paid to any address on approval.

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"Navigation and Nautical Astronomy" by Prof. J. H. C. Coffin, is a standard work of such universally recognized merit that the revised edition, just from the press, will be generally welcomed. The book has run through seven editions since it was originally prepared for the use of the United States naval academy by Pro. Coffin, late professor of astronomy, navigation and surveying at the naval academy, and the revisions by Commander Charles Belknap will be highly appreciated. Commander Belknap has brought the work fully up to date, all the examples being based on the ephemeris of 1898. Commander Belknap being called to Manilla was unable to see the work through the press and in his absence the proofs were read by Lieut. E. H. Tillman, U. S. N., assistant instructor in navigation at the United States naval academy.

Published by D. Van Nostrand Co., New York; price $3.50.

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The latest contribution to Charles Griffin & Co.'s nautical series is "A Manual of Algebra," for the use more especially of the young sailors and officers in the merchant navy, by Richard C. Buck of the Thames nautical training college, H. M. S. Worcester. The author states that the book being chiefly intended for sailors, who may be assumed to have neither time nor inclination for theories, the usual course has been abandoned, and all explanations are given in the simplest manner consistent with mathematical accuracy. Algebra has not been entered into deeply and many technicalities and rules of secondary importance have been omitted or are only briefly noted. The author says: "It appears to me after many years spent in connection with the education of the officers of our mercantile marine, and after the perusal of the scientific works written for sailors, that the theory and practice of equations should form the stable part of an algebra which is intended for the nautical student. I have consequently given special attention to this branch of my subject and have introduced equations such as the student is likely to meet with in his perusal of works on steam, naval architecture, mechanics, etc. It is all important that he should be able to grasp the meaning of these equations, and make use of them, though the investigations by means of which they were derived may be quite beyond his powers as an algebraist. A chapter on logarithms is added as it is most desirable that he who so often uses these valuable aids to calculations should have some knowledge of their derivations." The examples and exercises are taken from examination papers given to the cadets of the Worcester.

Received through the J. B. Lippincott Co., Philadelphia; price $1.50.

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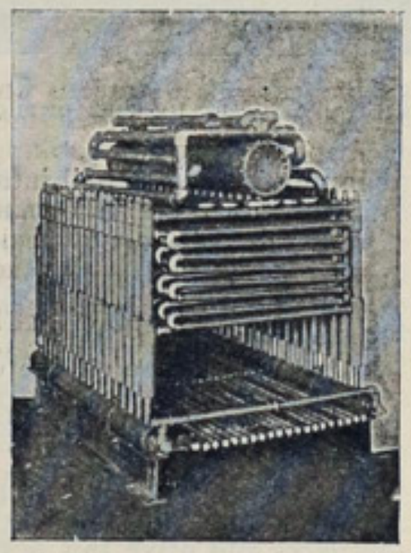
## BUCKLEY WATER TUBE BOILER.

Rochester, N. Y., Nov. 29.—While at the Rochester Machine Tool works in this city a few days ago, I was shown a cablegram from England ordering one of the Buckley patent safety water tube boilers. The Rochester works also received on the same day an order for a 6 H. P. boiler and a 4 H. P. Acme engine from New Zealand. The boiler to be shipped to England is the second order by the same firm, and is of 20 H. P.. Its dimensions will be: Length, 40 inches; width, 28 inches; height, 44 inches. It is to be shipped in sections, each package to weigh not over 100 pounds.



A peculiar feature of the Buckley boiler is that it can be built in any shape desired. It is so constructed in sections that should by any chance one of the sections become damaged, it can be completely removed in about 20 minutes, and the boiler continued in operation while repairs to the damaged parts are being made. The manufacturers claim that the boiler cannot be disastrously exploded, and that it cannot become foul, owing to the fact that all sediment is deposited in the water space below the fire, from which it can be readily blown out or removed when the boiler is cold. The feed water is heated to, or near, or above the boiling point before entering the water leg of the boiler in a series of pipes just beneath the steam dome, the exhaust steam supplying the necessary heat. This boiler is built so that either coal, coke, wood or oil can be used as fuel. Owing to the extreme compactness of this type of generator, it is meeting with great favor among yacht owners.

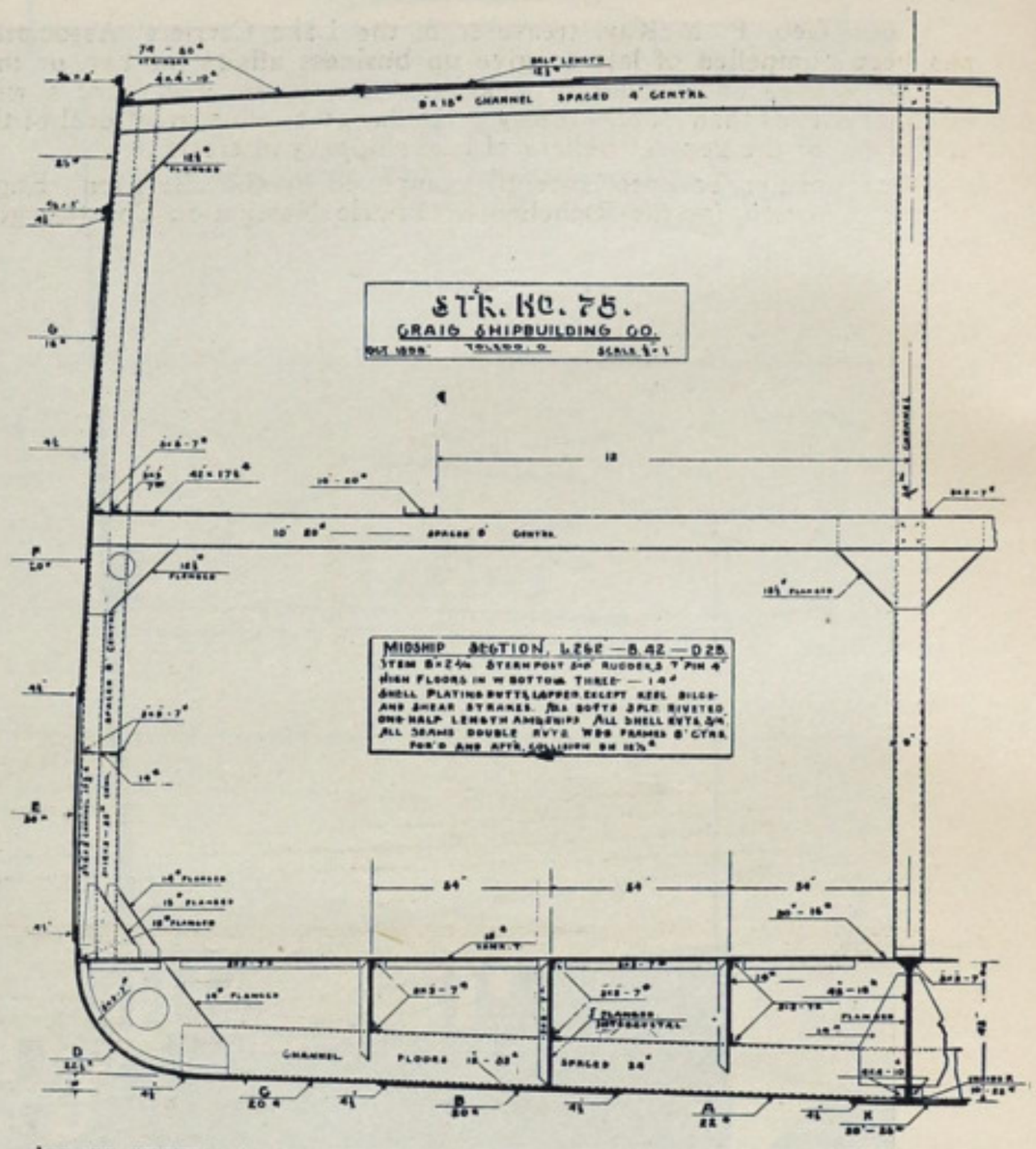
A. E. B.

## SHIP FOR LAKE AND ATLANTIC SERVICE.

DESCRIPTION OF A STEEL FREIGHTER BUILDING AT THE YARD OF THE CRAIG SHIP BUILDING CO., TOLEDO, O.

No disposition has as yet been made of the steel freight steamer upon which work was recently begun at the yard of the Craig Ship Building Co., Tolodo, O. It is announced that the vessel will be disposed of provided she can be sold outright, but a proposition for the purchase of a controlling interest has been rejected, the officials of the Craig company stating that unless an outright sale can be effected they will manage the vessel themselves. The new boat, which has not, of course, been named as yet, will have about the same carrying capacity as the steamers St. Paul and Minneapolis, owned by R. R. Rhodes of Cleveland, and she is designed for the same service—from lake ports to Montreal—her dimensions being such as to permit of ready passage through the Welland canal and also through the St. Lawrence canals to the Atlantic seaboard, when the enlargement at present under way is completed.

The new vessel will be 262 feet over all, 243 feet on the water line,




CROSS SECTIONAL DRAWING OF THE VESSEL BUILDING BY THE CRAIG CO.

42 feet beam and 25 feet depth of hold. She is intended to carry 3,000 gross tons on a draught of 18 feet, and will have a triple expansion engine with cylinders of 19, 30 and 52 inches diameter by 40-inch stroke, and surface condensers. Steam will be supplied from two boilers each 12½ by 11½ feet. The vessel will be equipped with steam stearing gear, steam windlass, capstans and deck hoists, and will be ready to go into commission at the opening of the season of navigation of 1899.

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An excellent portrait of W. J. Wood, naval architect, with the Goodrich Transportation Co., of Chicago, appeared in a recent issue of the American Ship Builder, of New York, accompanied by a sketch telling of his connection with ship building concerns on the Clyde, at Belfast, and in this country. Mr. Wood's early training was with Russell & Coy, of Glasgow, Caird & Co., of Greenock, and Harland & Wolff, of Belfast. He was chief hull draftsman with the Globe Iron Works Co., of this city, when the elegant lake passenger steamers North West and North Land, with quadruple expansion engines and Belleville water tube boilers, were built by that company. In referring to these ships, a few days ago, a gentleman who was associated with Mr. Wood in the work of planning their construction said: "In ship building lines, as in other engineering work, it very often happens that credit is not given to men who are really entitled to the honor that attends the successful outcome of a big undertaking. The Northern line steamers have been admired by thousands of people, and several names have been mentioned in connection with their construction. I have never heard Mr. Wood's name mentioned in this regard, and yet I know that all the details connected with the design of hulls and general arrangement of these ships passed through his hands, and were almost entirely under his direction."

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Senator McMillan of Michigan has already taken up with the United States light-house officials the matter of additional aids to navigation on the lakes, appropriations for which will be sought at the next session of congress. If it were not for the inability of the district officers on the lakes to handle more gas buoys than are now in use here, on account of an insufficient number of vessels for this purpose, the light-house board would undoubtedly have assigned more of these buoys to the lakes during the present season. It is the intention, therefore, to have members of the Lake Carriers' Association urge their congressmen to act with Senator McMillan in this matter, in order that the light-house officials may secure an appropriation for another vessel or two, during the coming winter, and thus provide for the care of more of these valuable aids to navigation.

### NOTES IN GENERAL.

Seven steamers of 1,100 tons each will be built by A. & J. Inglis, of Glasgow, for R. G. Reid, of St. Johns, Newfoundland. The vessels will be used on connecting lines between Canadian and Newfoundland railways.

Chief Engineer Anderson, of the Canadian department of marine and fisheries, has recommended that twenty-five additional spar buoys be placed in the St. Lawrence channel between Montreal and Quebec, and also six range lights, for which foundations are now being built.

The cruiser San Francisco is to be laid up and completely overhauled at a cost of something like $150,000, and she will go out of commission just about the time the remodeled cruiser Chicago goes in as a practically new vessel, with new machinery and armament and ability to make 18 knots speed.

An effort is still being made at Washington to remove Capt. Frank Danger, local inspector of hulls at Port Huron. The change, if it is made, will certainly not have the approval of vessel men, who are opposed to politics in the steamboat inspection service and who regard Capt. Danger as one of the most competent men on the lakes.

Capt. Geo. P. McKay, treasurer of the Lake Carriers' Association, has been compelled of late to give up business affairs for two or three days at a time on account of sickness. Few vessel men have a wider circle of friends than Capt. McKay. He has given up a great deal of time and labor for the general welfare of lake shipping interests.

The steamer Toronto, recently completed by the Bertram Engine Works, Toronto, for the Richelieu & Ontario Navigation Co., was given a very satisfactory three-hours trial a few days since. Officers of the Richelieu & Ontario company, as well as the representatives of the builders who were on board, expressed themselves as entirely satisfied.

Improvements to be made the coming winter by the Duluth & Iron Range road will cost in the neighborhood of $600,000. These will include the entire rebuilding of dock No. 1 at Two Harbors, making it 45 feet high and enlarging the pockets. The present structure will have to be taken down to the water, and the substructure completely overhauled and rebuilt. This dock work alone will cost probably $300,000.

The reorganized ship building plant of the Maryland Steel Co., at Sparrows Point, Maryland, seems to have secured another order. Bids were opened by the navy department Wednesday for the construction of a steel floating dock at Algiers, La., for which congress appropriated $850,000. Only two proposals were submitted. Charles L. Bradbury, of New York, submit ed a bid of $8?0 000. The Maryland Steel Co. offered to bid on department plans for $837,000, and on modified plans for $810,000.

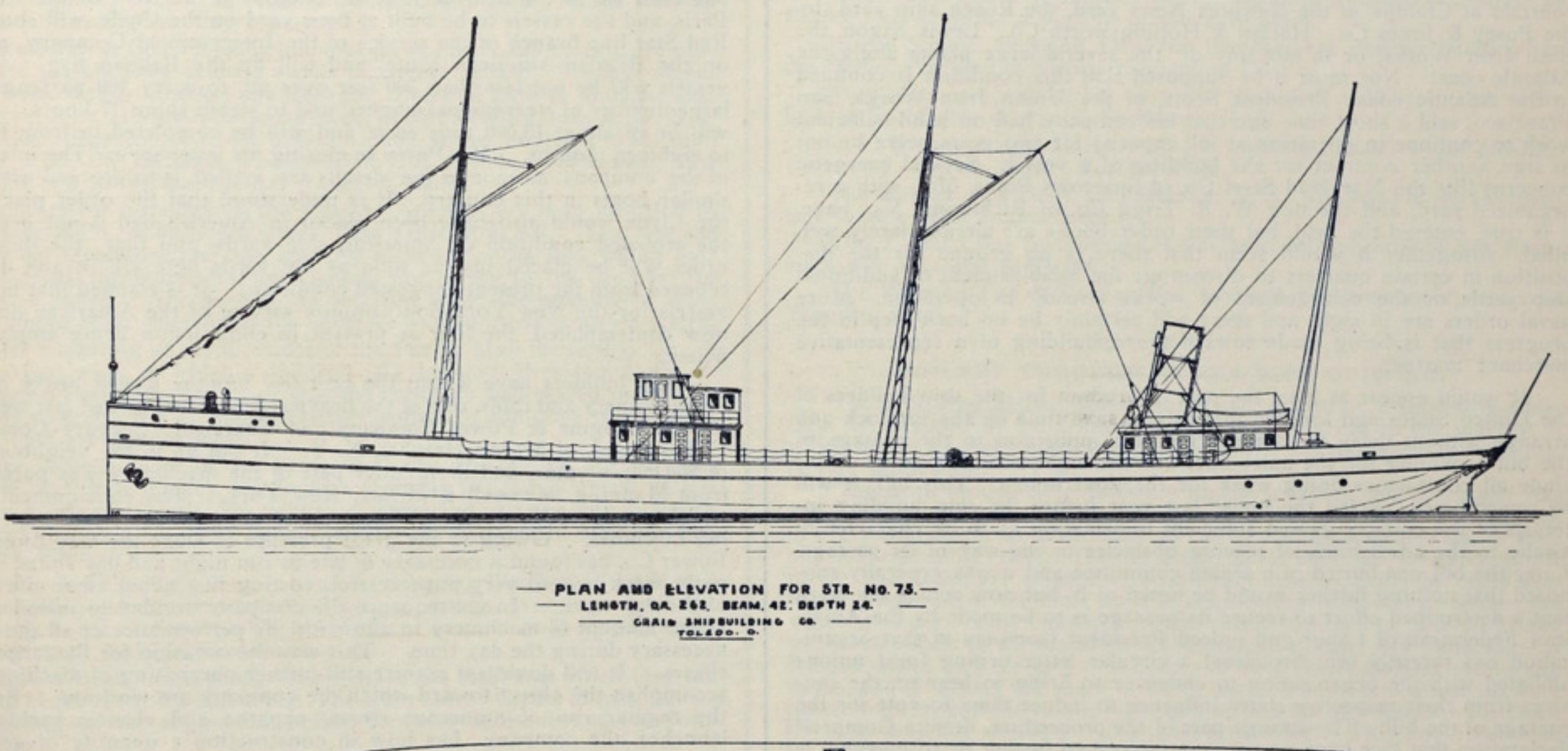
Probably nowhere in the world is repair work on steel vessels done as rapidly as in the lake dry dock plants. The Mutual line steamer Corona, which damaged some twenty plates and sixty frames by stranding at Ashtabula recently, went into one of the docks of the ship owners company, Cleveland, on the evening of Thursday, the 24th, and was on her way up the lakes again the following Tuesday morning. The work of repairing the vessel was not begun until Friday morning and nothing was done on Sunday, so that the actual working time on the job was little more than three days.

Commodore Newberry's yacht Truant is to have a Roberts water tube boiler. While returning from Detroit after making arrangements for this order, Mr. E. E. Roberts, president of the Roberts company, said he would soon take up the matter of getting his boilers into one of the 5,000-ton lake freight steamers. With this end in view he took with him to New York several blue prints of hulls and engines of modern lake steamers. He says his company proposes to put boilers into any of the big freighters on trial, just as they have done in several cases with yachts and tugs.

The last issue of the Review contained a short description of the oil tank steamer Atlas, a vessel of 720,000 gallons capacity, building at the Roach ship yard, Chester, Pa., for the Standard Oil Co., and which was launched a few days ago. It was said that this vessel would have windlass and capstans from the American Ship Windlass Co., but the most important part of her outfit, a No. 4 steam towing machine, built by the same company, was omitted. It is surmised that this steamer is intended to tow tank barges across the ocean to Europe, and to employ the towing machine for this purpose.

H. A. Foss, board of trade weighmaster at Chicago, has been visiting vessel men in Buffalo and Cleveland within the past few days. Alike to everything else connected with the Chicago board of trade, its supervision over the weighing and tallying of grain is systematic down to the very smallest detail. "We find occasion sometimes," said Mr. Foss, "to have as many as five men looking after a cargo. It may seem strange that so many men would ever be required to look after the loading of a vessel, but we often have cases where it will not do to depend upon elevator employees. This care is not prompted by a fear of intention on the part of the elevators or their men to be dishonest. Suppose, however, that a man employed in looking after a certain part of the machinery should leave it for a few minutes and come back to find that he could cover up his own negligence by shoveling into a bin fifty or more bushels of grain that had been lost by accident in his absence. Matters of this kind must always be taken into account."

It is understood that lake shipping interests will be given an informal hearing by the Anglo-American commission in Washington, probably next week, on the question of abolishing tolls on Canadian canals that connect the lakes with the Atlantic seaboard. President Dunham, Counsel Harvey D. Goulder and probably one or two other members of the Association will visit Washington when the matter of a hearing is definitey fixed. Washington dispatches have referred, within the past few days, to an effort to have the commission take up the subject of joint ownership of a deep waterway from the lakes to the Atlantic by way of the St. Lawrence, Lake Champlain and the Hudson. If anything is being done in this regard, it is not with the sanction of lake vessel interests. This problem is too cumbersome for the practical vesselmen, especially in view of the fact that Canada will have its own system of 14-foot canals through to tidewater next year. The commission will, however, undoubtedly come to some conclusion regarding the construction and maintenance of war ships on the lakes and also the lake fisheries. The regulations which now prohibit the building of vessels of war on the lakes will be modified, and a joint agreement for a closed season, regulation of size of nets, etc., will be entered into regarding the fisheries.




OUTBOARD AND DECK PLANS OF THE STEEL FREIGHT STEAMER BUILDING BY THE CRAIG SHIP BUILDING CO., TOLEDO.

# MARINE REVIEW

**Devoted to the Merchant Marine, the Navy, Ship Building, and Kindred Interests.**

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If additional argument is required for the claim that there is room for more ship yards in this country it will be found in the order placed on the Clyde, a few days ago, for two large steamers for the Red Star line service of the International Navigation Co. According to the statements from Philadelphia officials of the International company, the sole cause for the award of this contract to a Clyde firm, rather than to any of the builders of this country, was found in the fact that the crowded condition of American yards made it impossible for any of the home firms to handle the order, or at least to have the vessels finished within the year and a half specified for their completion. The fact that cost of construction has been steadily advancing on the Clyde of late, owing to a great rush of work, would seem to bear out the opinion that the order did not go to Scotland on account of the question of price, and this is further evidenced by the announcement that the Philadelphia company will place a similar order with an American firm as soon as the latter is in a position to handle it. That ship yards in all parts of the country are likely to be taxed to their full capacity for more than two years to come must be apparent to any one who has a knowledge of the amount of work under contract at Cramps, at the Newport News yard, the Roach ship yard, by the Pusey & Jones Co., Harlan & Hollingsworth Co., Lewis Nixon, the Bath Iron Works, or in fact any of the several large plants along the Atlantic coast. Nor must it be supposed that this condition is confined to the Atlantic coast. President Scott, of the Union Iron Works, San Francisco, said a short time ago that his company had on hand sufficient work to continue in operation at full capacity for two years, were he not to sign another contract for the building of a vessel. Several energetic concerns like the Maryland Steel Co. of Sparrows Point, Md., with a reorganized yard, and the new W. R. Trigg Co. of Richmond, Va., have, it is true, entered the field, but their order books are already farely well filled. Altogether it would seem that there is no ground for the disposition in certain quarters to discourage the establishment of additional ship yards or the enlargement of works already in operation. More naval orders are in sight and there will certainly be no back step in the progress that is being made toward the upbuilding of a representative merchant marine.

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It would appear at least the part of wisdom for the ship builders of the United States and kindred interests to take time by the forelock and arrange without delay for some organized opposition to the passage of the bill providing for the amendment of the eight-hour law so as to include all contractors doing work for the government. This bill, it will be remembered, passed the house last year before the ship building interests of the country gained sufficient information as to its character to awake to the advisability of placing obstacles in the way of its passage. Later the bill was buried in a senate committee and it was generally supposed that nothing further would be heard of it, but now comes the word that a determined effort to secure its passage is to be made by the American Federation of Labor and indeed President Gompers of that organization has recently sent broadcast a circular letter urging local unions affiliated with the organization to endeavor to bring to bear on the senators from their respective states influence to induce them to vote for the passage of the bill. The strange part of the proceeding, despite Gompers' declaration that "we have no partisan interest to further or to punish," is found in the fact that in no degree does this agitation seem to be founded on complaints eminating from the men employed in the ship yards, in view of which the sincerity of the American Federation may well be called in question. Early concerted action is all that is needed to kill the bill. There are in the senate many men, including Senators Frye, McMillan and Hanna, who are thoroughly conversant with the needs of the ship building industry, and with a little assistance they can be depended upon to see to it that there is none of the indifference or ignorance which seems to have marked the consideration of the measure in the house. Moreover, the ship builders should not lack co-operation from other sources, for should the bill become a law all the ship building supply concerns, including the Carnegie Company and the Bethlehem Iron Co., makers of armor plate, would be effected, as well as the manufacturers who furnish clothing for the navy, powder mills, gun factories, fueling concerns, coal operators, etc. It is assuredly not too early to begin at once an earnest agitation against the bill. A campaign of education is all that is needed to put a quietus on it permanently.

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The palpable canard relative to the formation of a ship building trust, which has been telegraphed around the country in two or three different forms of late, is so void of even the semblance of facts that it has not been given momentary credence by anyone at all conversant with the industry. It resembles in its crudeness a similar fiction of earlier date, the only foundation for which was the refusal of four prominent ship building firms to build double turreted monitors on an appropriation little more than sufficient for one. Ship builders generally will applaud the way in which President Orcutt of the Newport News Ship Building & Dry Dock Co., struck out from the shoulder in declaring that "the whole story is a deliberate lie." That Mr. Orcutt's company has endeavored in every way to help the navy department, not only in this difficulty but in others which have arisen, is so well known that his mention of it is all but unnecessary, and assuredly what is true of the existence of such a disposition on the part of the Newport News company has long been patent in the case of almost all other ship building concerns engaged on government contracts. As President Orcutt has said, "everybody who knew anything at all about it was aware that a double-turreted monitor could not be built as cheaply as a single-turret fighter, and there is no reason to believe that the secretary or other officials of the navy department for a moment entertained any such idea."

# MANY CONTRACTS.

## THEY ARE IN SIGHT FOR THE SHIP BUILDERS OF THE UNITED STATES—TWO LARGE STEAMERS TO BE BUILT IN THIS COUNTRY BY THE INTERNATIONAL NAVIGATION CO. FOR RED STAR LINE SERVICE—CONTRACTS AWARDED FOR TWO NEW CROMWELL LINERS—ORDERS OF LESSER IMPORTANCE RECENTLY PLACED —OTHERS IN PROSPECT.

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The International Navigation Co. of Philadelphia will build two large passenger steamers in this country in the immediate future. This announcement was made to the Review this week by Mr. Howard Pusey, private secretary to Mr. Clement A. Griscom, president of the International Co., in connection with an authentic statement regarding the building program of the company. In the letter to the Review it is stated the cable announcing the placing of an order for six steamers is incorrect. An order has been placed for but two, and the details of these have not yet been determined. The contract for the two vessels mentioned has been let to the firm of J. & G. Thompson, builders of the steamer Paris, and the vessels to be built at their yard on the Clyde, will enter the Red Star line branch of the service of the International Company, plying on the Belgian-American route, and will fly the Belgian flag. These vessels will be not less than 560 feet over all, to carry 400 passengers, a large number of steerage passengers, and to steam about 17 knots. They will be of about 13,000 tons each, and will be completed in from fifteen to eighteen months. Mr. Pusey in closing his letter says: "The intention of the company, as soon as the details are settled, is to proceed with two similar boats in this country. It is understood that the order placed on the Clyde would also have been placed in America had it not been for the crowded condition of American ship yards, and that the duplicate order will be placed just as soon as the yards here are in any degree relieved from the present congested condition. It is claimed that no new vessels for the New York-Southampton service of the American line are now contemplated, the four at present in commission being amply sufficient.

Ship builders have within the past few months placed heavy orders for machinery and tools, one of the heaviest being that placed last week by the Gas Engine & Power Company and Charles L. Seabury Company, Consolidated, of Morris Heights, N. Y. It ran up in the neighborhood of $50,000 in value, and the greater part of the machinery was purchased from Manning, Maxwell & Moore, New York. The consignment consisted mainly of Reed lathes, Putnam planers and Brown & Sharpe milling machines. Owing to the great pressure of work the Gas Engine & Power Co. has found it necessary of late to run night and day shifts. The night work proved very unsuccessful, costing just about twice the labor of the day work. In consequence the company decided to install a sufficient amount of machinery to allow for the performance of all the work necessary during the day time. This was the occasion for the large purchases. It will doubtless require still further purchasing of machinery to accomplish the object toward which the company are working. Besides the regular run of numerous steam, naphtha and electric yachts and launches, the company has now in construction a quantity of government work. The United States torpedo boat destroyer Bailey is now well on toward completion, and the company has also received orders for the torpedo boat destroyer Stewart and the torpedo boat Wilkes. As these craft are being built in their entirety at the Morris Heights yards, a large amount of machine work is required in the building of the engines, boilers and other machinery. Work on the two boats last named has not been commenced as yet. The torpedo boat destroyer Bailey is the first to be constructed entirely in this country. The work is of a very high class. The engine forgings throughout are of oil tempered nickel steel. There will be two engines of 3,000 horse power each, and four water tube boilers, all to be of the Seabury design. This boat is to attain the speed of 30 knots per hour and continue at this speed for two hours. The engine forgings were made by the Bethlehem Iron Co.

The Newport News Ship Building & Dry Dock Co., Newport News, Va., has closed a contract which has been hanging fire for some time for the construction of two 5,000-ton steamers for the coastwise trade of the Cromwell line. Each vessel will be 406 feet over all, 48 feet beam, and 33 feet girders. The specifications call for the building of the vessels on flat plate keels. Bilge keels will also be provided. There will be three decks, with houses on the upper promenade decks. Accommodation will be provided for 50 first-class and 186 steerage passengers. Steerage accommodations will be located on and below the upper deck, and quarters for officers and men will be provided on the main deck. The vessels will be propelled by single screws with manganese bronze blades. Engines will be of the inverted triple expansion type. There will be three double-ended boilers, with a working pressure of 180 pounds per square inch, and having six circular corrugated furnaces. There will also be a donkey engine for supplying power in port, and the vessels will be fitted with steam stearing gear, windlass, hoists and deck pumps, and a complete equipment of lifeboats, rafts, and other safety appliances. Construction will be superintended by Horace See, naval architect, of No. 1 Broadway, New York.

The Port Richmond and Bergen Point Ferry Co., of which John D. Crimmins is president, has just placed a contract with the Pusey & Jones Co., of Wilmington, Del., for a new side-wheel steel ferryboat to run between Bergen Point, N. J., and Staten Island. This vessel will be 140 feet over all; beam over guards 52 feet, and depth 9 feet 11 inches. She will have an American jet condensing engine, 30 inches diameter of cylinder by nine feet stroke of piston, one steel return tubular boiler, and will be

lighted throughout by electricity. She is to be finished ready for service by June, 1899, and is intended to afford better facilities for the rapidly growing travel between Jersey City and Staten Island.

Capt. Ed. Howard, the well-known ship builder of Jeffersonville, Ind., has begun work on the largest tow boat yet constructed for the United States government service on the Mississippi River. She will be known as the Col. William R. King, and will be constructed entirely of steel, 200 feet over all, 40 feet beam, and 6 feet depth of hold. The hull will be compartmented with steel bulkheads. Her engines will be 24-inch cylinders with 10-foot stroke, and she will have a battery of six steel boilers, each 23 feet long by 40 inches diameter, with two 10-inch flues. The vessel with equipment, which will be thoroughly modern, and include an electric plant, will cost in the neighborhood of $200,000.

The bureau of supplies and accounts, navy department, Washington, D. C., has called for bids for furnishing the navy yards at Portsmouth, N. H., and New York City, with machinery and tools. Among the articles required for the Portsmouth yard are a bolt cutter, one shaping machine, a universal brass lathe, one 24-foot engine lathe, a universal radial drill, a self-acting planing machine, and several trimmers. At the New York yard the articles required include a horizontal boring and drilling machine, one 15-inch pillar shaper, grinders, turning lathes, and a hydraulic copper bender.

A rumor is in circulation to the effect that the Chesapeake & Ohio Railroad Co. has contracted with the W. & A. Fletcher Co., Hoboken, N. J., for a side-wheel passenger steamer, to be placed on the route between Newport News and Norfolk. According to the report she will be 190 feet over all, 30 feet beam, and 10 feet 6 inches depth, to be furnished with Fletcher engines, feathering wheels, electric light plant, steam steering gear, and other modern improvements.

Alfred Box & Co., Philadelphia, makers of hoists and cranes, are busier at the present time at their works than ever before. Among recent orders booked they mention one from the Diamond Drill & Machine Co., Birdsboro, for a 110-ton electric traveling crane; another from R. D. Nuttall & Co., Allegheny, Pa., for a 15-ton hand-power traveling crane, and another from the Cataract Construction Co., North Tonawanda, New York, for two 15-ton hand-power traveling cranes.

Contract for purchase of the steamer Atlantic has been awarded to McAllister & Co., of 39 South street, New York, at $1,509. This was the highest bid received under the opening of two months ago, which bids were rejected, the Quartermaster General not caring to sell the boat for so small a figure. The highest bid received under the opening of Nov. 14 was about $800, whereupon the contract was awarded as above stated.

After a meeting of the directors of the Pacific Mail Steamship Co., in Chicago last week, at which a dividend was declared, President Collis P. Huntington stated that the story that the company had placed orders for two new steamers was at least premature, although additions to the company's fleet are contemplated.

Capt. Warren Elsy of the Vesta Coal Co., Pittsburgh, Pa., has announced that the company will build a towboat 138 feet over all, 34 feet beam, and four feet depth. She will have compound engines with cylinders of 22 and 11 inches, by 7-foot stroke, built by the McConnell Machine Co., Marietta, Ohio.

Arthur Sewall, Bath, Me., is quoted as saying that he will build two or three 3,500-ton four-masted steel sailing vessels ever year until the Nicaragua canal is constructed, after which he anticipates engaging in the building of steel freight steamers.

Johnson Bros., Ferrysburg, Mich., have the steel tug which they are building about ready for launching. Ver Duin Bros., Grand Haven, Mich., will place in her the engine and boilers formerly in the fishing tug John A. Miller.

R. W. Birnie & Son, Wilmington, Del., have secured the contract for furnishing the sails, awnings and covers for the steamer S. C. Morgan, recently completed at the yard of the Harlan & Hollingsworth Co., Wilmington, Del.

The large steel hull of the Texas & Pacific Railway Co.'s new transfer boat, built by the Iowa Iron Works, Dubuque, Ia., has arrived at New Orleans, where her machinery will be put aboard. The Iowa Iron Works has launched two vessels within the past three weeks.

Washburn Bros., Thomaston, Me., have launched the large schooner John C. Haynes. She will be equipped with a 20-horse-power boiler and engine built by Ross & Morrison, Cambridgeport, Mass., a Knowlton Bros. patent steam windlass, and a 6-inch Dean wrecking pump.

The ship yard of John S. Starin, at West New Brighton, S. I., was recently visited by fire, which did damage estimated at $400,000. Of this amount the loss on the machinery aggregated $300,000. The four dry docks, each valued at $150,000, were saved.

S. B. Greacen, Perth Amboy, N. J., is building the engine for the steam lighter Ruth, under construction by H. J. Rodermond, Tompkins Cove, N. Y.

An unconfirmed report is to the effect that the Boston & Bangor line will build a new passenger steamer which will exceed the City of Bangor in length by 15 feet.

The government is understood to have made a contract with the Merritt-Chapman Wrecking Co., Wall street, New York, for the recovery of the Spanish cruiser Reina Mercedes at Santiago.

Specifications for the hydraulic glue press for the Washington navy yard, for which bids are now being asked, provide that it shall be 24 feet long, 4 feet 6 inches wide, and weigh in the neighborhood of 52,000 pounds.

The Newport News Ship Building & Dry Dock Co. has secured the contract at $175,000 to overhaul and remodel the United States transport Manitoba.

Capt. Louis Daniels, Vergennes, Vt., is building a passenger steamer, 66 feet over all, 56 feet keel, 12 feet beam and 6 feet depth. She will have a capacity of 150 passengers.

A new steamer, as yet unnamed, building at Perry's ship yard, Chattanooga, Tenn., for the Tennessee River Navigation Co., was launched last week. The machinery is now being placed aboard.

A light-draught steamer, the Henry W. Grady, built and owned by Webster & Rose, Kingston, Tenn., was launched last week, and will be ready to go into service within a short time.

The Harlan & Hollingsworth Co., Wilmington Del., is constructing new ways for the torpedo boat destroyers Hopkins and Hull. The yard is at present being worked to its full capacity.

Brown & Miller, Jersey City, N. J., have the contract for the machinery for the steam lighter Iron King, building for Collyer Bros., New York.

The Burlee Dry Dock Co., Port Richmond, S. I., has launched the 140-foot tug Prudence, building for the Tice line, 1 Broadway, New York.

Frank Gurney, proprietor of the Central Iron Works, East Boston, Mass., is having a 65-foot wooden steam yacht built at Marblehead, Mass.

Kelly, Spear & Co., Bath, Me., will enlarge their yard, and have leased the land adjoining in order that additional berths may be provided.

E. W. Heath, Benton Harbor, Mich., has launched the tug W. H. Meyer, said to be one of the largest and most powerful on Lake Michigan.

The steam yacht recently built in Chicago for E. H. R. Green, of the Texas Midland railway has been launched at Arkansas Pass, Texas.

It is rumored that Wm. P. Clyde & Co., New York, will establish a line of freight steamers between New York and Providence, R. I.

A. D. Story, Essex, Mass., has two schooners on the stocks, and Tarr & James, also of Essex, have a large schooner well under way.

Axton & Sons, Brownsville, Pa., will be ready in a few weeks to launch the vessel building for the McKinley Coal Co.

James B. Donnelley, Buffalo, N. Y., has been awarded a contract at $25,988, for dredging a portion of the Erie basin.

Joseph Supple, Portland, Ore., has launched the steamer building for the Dalles, Portland & Astoria Navigation Co.

Two schooners, one of 110 tons, and the other of 130 tons, are to be built at Bachman's ship yard, Shelburne, N. S.

C. F. Brown, Pulpit Harbor, Me., is building a small steam pleasure craft for J. Murray Howe, Boston, Mass.

The Halifax Dry Dock Co., Halifax, N. S., will build a steel brigantine for the West Indian trade.

The Yaquina Bay Steamship Co. has been incorporated at San Francisco with a capital of $50,000.

The Wiarton Tug & Towing Co., Limited, has been incorporated at Toronto, Ont.

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### BOILERS THROUGH SMOKE-PIPE OPENING.

The following extract from the annual report of Engineer-in-Chief Geo. W. Melville of the United States navy, referring to the manner in which new water tube boilers were fitted in the old single-turret monitors, is very interesting:

"The work immediately necessary on the breaking out of the war was not so much extensive repairs to ships in commission as the fitting out of every available ship in ordinary so as to get some service out of each one in the possible crises. The old single-turret monitors were susceptible of fair use as harbor defense vessels if they could quickly be made seaworthy, and one of the most notable engineering feats was in connection with this work. This consisted in the actual cutting out of the old and worn-out boilers of the monitors Manhattan, Mahopac, and Canonious, at League island, and erecting new boilers in their places without cutting the decks, and all within the space of thirty days. The boilers as cut up were passed out through the smoke pipe opening and the new sections put down the same way, the results proving most satisfactory. This work was done by the Babcock & Wilcox Co. under contract, and this firm deserves great credit for the expedition with which the work was done. It was well known that these vessels could not be used unless new boilers were fitted, and before war was declared the bureau had ascertained that the firm mentioned was the only one which could do the work in less than three months. Arrangements for beginning the work promptly had been made, and in less than five hours after the new boilers were authorized by the department the work of building them was commenced. It is a source of satisfaction that the performance of these vessels with new boilers exceeded that when the vessels were first built."

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### SAMPLE CONSIGNMENT OF GRAIN AT BUFFALO.

Buffalo, N. Y., Nov. 30.—Herewith is presented a copy of a sample consignment of a cargo of grain from Duluth to Buffalo on the steamer H. S. Holden. The cargo was delivered here last week. Although there were ten separate bills of lading, and nine separate consignments in the cargo, the steamer had to deliver at only seven elevators, and that notwithstanding there are two or three more elevators in the harbor that a vessel the size of the Holden could get to.

| | Bushels. | Kind of Grain. | Consigned to |
|---|---|---|---|
| Hold 1..... | 24,000 | No. 1 Hard spl. | Great Northern Elevator. |
| " 1..... | 7,000 | " " | Connecting Terminal Elevator. |
| " 1..... | 10,000 | " " | City Elevator. |
| Holds 2 and 3..... | 28,000 | No. 1 Nov. spl. | City Elevator. |
| " 2 and 3..... | 10,000 | " " | Chas. Kennedy & Co. |
| " 2 and 3..... | 50,000 | " " | Central Milling Co. |
| " 2 and 3..... | 10,000 | " " | Watkins & Anderson. |
| " 2 and 3..... | 20,000 | " " | Thornton & Chester. |
| Hold 4..... | 42,000 | No. 2 " | Coatsworth Elevator (L. V.) |
| " 4..... | 8,000 | " " | Whitney & Gibson. |

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# NAVAL PROGRAM.

**IT IS OUTLINED BY SECRETARY LONG IN HIS ANNUAL REPORT JUST PUBLISHED—THE BATTLESHIPS AND TWELVE CRUISERS—LIST OF VESSELS PURCHASED FOR THE AUXILIARY NAVY AND THE PRICES PAID FOR THEM—OTHER RECOMMENDATIONS WITH REFERENCE TO THE AFFAIRS OF THE DEPARTMENT—THE NAVAL PERSONNEL BILL.**

The annual report of Secretary of the Navy John D. Long is most valuable in many respects, but especially in view of the fact that it embodies practically a complete history of naval affairs during the late war. Readers of the Review will naturally be inclined, however, to give first attention to recommendations regarding new ships. The Secretary's recommendations in this regard are as follows:

Three seagoing sheathed and coppered battleships of about 13,500 tons trial displacement, carrying the heaviest armor and most powerful ordnance for vessels of their class, and to have the highest practicable speed and great radius of action. Estimated cost, exclusive of armor and armament, $3,600,000 each.

Three sheathed and coppered armored cruisers of about 12,000 tons trial displacement, carrying the heaviest armor and most powerful ordnance for vessels of their class, and to have the highest practicable speed and great radius of action. Estimated cost, exclusive of armor and armament, $4,000,000 each.

Three sheathed and coppered protected cruisers of about 6,000 tons trial displacement, to have the highest practicable speed and great radius of action, and to carry the most powerful ordnance suitable for vessels of their class. Estimated cost, exclusive of armor and armament, $2,150,000.

Six sheathed and coppered cruisers of about 2,500 tons trial displacement, to have the highest speed compatible with good cruising qualities, great radius of action, and to carry the most powerful ordnance suited to vessels of their class. Estimated cost, exclusive of armament, $1,141,800 each.

The Secretary recommends the revival of the grades of Admiral and Vice-Admiral temporarily, as when they were instituted to reward certain officers who rendered distinguishe1 service during the civil war.

Other recommendations are: 1. A strength of 20,000 men, and 2,500 apprentices. 2. Rewards by "some other system" than advancement in numbers, "and also, that in those cases in which officers have during the present war been jumped, it shall be provided that this shall not operate to their disadvantage, and that they shall still have their regular promotion as before. Bills have been drawn for both these objects, and will be submitted to congress." The Secretary says that the jumping done already will deprive some officers of $750 per year in retired pay. 3. Authority to the president to appoint five naval cadets yearly from the naval apprentices. 4. The legal institution of the office of naval intelligence. 5. A corps of judge advocates corresponding to the organization in the army. 6. A naval reserve on the lines laid down in Commodore Crowinshield's report. 7. The control by the navy of all sea transport. "To make the transport service efficient," says the Secretary, "it must necessarily be carried on in vessels large enough to carry a complete infantry regiment with all accoutrements, arms, ammunition, supplies, etc., landing at their destination in as good or better condition than when received on board." 8. The repeal of the five years limit in the statute authorizing the removal of the charge of desertion in certain cases. 9. Retirement for enlisted men who have served 30 years. 10. That the provisions of the act of August 1, 1890, relating to the examination of officers of the army for promotion should be made applicable to the navy. It provides that an examining board shall resolve itself at once into a retiring board in cases where the candidate for promotion is found physically disqualified. 11. That the legal classification of vessels shall be altered to a tonnage basis. 12. Increase of the pay corps. 13. Examination of chief engineers preliminary to each step of promotion. 14. Increase of the naval supply fund from $1,500,000 to $2,500,000. This fund has been found to advance economy and efficiency.

The passage of the personnel bill is advocated. The Secretary says: "This measure, it is believed, meets the views of the great body of naval officers. Its essential fairness is recognized by all, and in the opinion of the department its enactment will result in incalculable benefit to the service. The amalgamation of the officers of the line and the engineer corps is a natural evolution, and involves no radical departure in the education of officers. It removes causes of friction and jealousy. It makes officers of the line capable of performing duty in the engine room as well as on deck, and officers of the engineer force capable of taking a turn of watch duty or fighting the ship should it become necessary. The additional number of officers which it provides is less than was asked for by the department in its last annual report, but this deficiency, it is believed, will be made up by the provision authorizing the appointment of warrant machinists."

## COST OF AUXILIARIES.

**SECRETARY LONG EMBODIES IN HIS REPORT A HIGHLY INTERESTING TABLE GIVING FOR THE FIRST TIME THE PRICES AT WHICH VESSELS WERE ACQUIRED BY THE DEPARTMENT.**

In that part of his annual report dealing with the purchase of vessels for the auxiliary navy Secretary Long says: "Upon the passage of the bill appropriating $50,000,000 for national defense, the department at once took steps for the purchase of auxiliary vessels. On March 12 a board was appointed and directed to communicate with the owners of vessels and obtain from them the terms on which they were willing to sell or charter, and to examine thoroughly such vessels as the department might designate, or the board consider desirable for the use of the navy, giving particular attention to the condition of the boilers and engines, coal capacity, etc. The following is the list of vessels purchased.

| Original Name. | Renamed. | Previous Owner. | Purchase Price. |
|---|---|---|---|
| Columbia | Wasp | J. H. Ladew | $ 95,000 |
| Alica | Hornet | Henry M. Flagler | 117,500 |
| Almy | Eagle | Frederick Gallitin | 110,000 |
| Hermione | Hawk | Henry L. Pierces estate | 50 000 |
| D. C. Ivans | Nezinscot | Moran & Co | 30 000 |
| P. H. Wise | Sioux | Moran & Co | 25,553 |
| Winthrope | Osceola | Staples Coal Co | 100,000 |
| El Toro | Accomac | Southern Pacific Co | 40,000 |
| Wilmot | Potomac | Ocean Tow & Wrecking Co | 125,300 |
| Ed Luckenbach | Tecumseh | Luckenbach & Co | 45,000 |
| W. A. Luckenbach | Uncas | Luckenbach & Co | 75,000 |
| Atlas | Wampatuck | Standard Oil Co | 65,000 |
| Josephine | Vixen | P. A. B. Widener | 150,000 |
| Mayflower | Mayflower | Ogden Goelet estate | 430,000 |
| Sovereign | Scorpion | M. C. D. Borden | 300,000 |
| Creole | Solace | Cromwell S. S. Line | 600,000 |
| Diogenes | Topeka | Thames Iron Works | 170,327 |
| Not named | Manly | Charles R. Flint | 24,250 |
| Not named | Somers | Schichau Iron Works | 72,997 |
| Saturn | Saturn | Boston Towboat Co | 290,000 |
| Lebanon | Lebanon | Phila. & Reading R. R. Co | 225,000 |
| El Norte | Yankee | Southern Pacific Co | 575,000 |
| El Rio | Dixie | Southern Pacific Co | 575,000 |
| El Sol | Prairie | Southern Pacific Co | 575,000 |
| El Sud | Yosemite | Southern Pacific Co | 575,000 |
| Nictheroy—El Cid | Buffalo | Brazilian Government | 575,000 |
| Amazonas | New Orleans | Brazilian Government | 1,429,215 |
| Almirante Abru | Albany | Brazilian Government | 1,205,000 |
| Merrimac | Merrimac | Hogan Line | 342,000 |
| Niagara | Niagara | Ward Line S.S. Co | 200,000 |
| Sterling | Sterling | Black Diamond Trans Co | 190,000 |
| Enterprise | Modock | American Towing Co | 30,000 |
| No. 18 | No. 18 | Phil. Trans. & Light Co | 2,800 |
| Nashan | Nashan | Frank Smythe | 155,728 |
| Zafiro | Zafiro | China & Manila S. S. Co | 87,597 |
| Alice | Alice | John M. Worth | 19,000 |
| C. G. Coyle | Choctaw | W. G. Coyle | 82,500 |
| Penwood | Powhatan | Walsh & Doran | 42,500 |
| Fearless | Iroquois | J. D. Spreckles Bros. Co | 150,000 |
| Vigilant | Vigilant | J. D. Spreckles Bros. Co | 60,000 |
| Active | Active | J. D. Spreckles Bros. Co | 75,000 |
| Hercules | Hercules | Standard Oil Co | 40,000 |
| Southery | Southery | Ed. Luckenbach | 100,000 |
| Venezuela | Panther | Red D. Line S. S. Co | 375,000 |
| Yumuri | Badger | Ward Line S. S. Co | 367,000 |
| Yorktown | Resolute | Old Dominion S. S. Co | 475,000 |
| T. P. Fowler | Mohawk | Cornell Steamboat Co | 44,000 |
| Thespia | Hist | David Dows, Jr | 65,000 |
| Restless | Restless | Hiram W. Sibley | 29,000 |
| Illawara | Oneida | Eugene Tompkins | 60,000 |
| Viking | Viking | Horace A. Hutchins | 30,000 |
| Chatham | Vulcan | Merchants & Miners Line | 350,000 |
| Penelope | Yankton | H. E. Converse | 125,000 |
| Right Arm | Pontiac | Merritt & Chapman | 30,000 |
| Philadelphia | Peoria | Phila. Pilot Association | 100,000 |
| Corsair | Gloucester | J. Pierpont Morgan | 225,000 |
| Menemsha | Iris | Miami Steamship Co | 145,000 |
| John Dwight | Pawnee | George T. Moon | 25,000 |
| Justin | Justin | Bowring & Archibald | 145,000 |
| Hortense | Takoma | O'Connor & Smoot | 28,000 |
| Aileen | Aileen | Richard Stevens | 55,000 |
| Scindia | Scindia | Henderson Bros | 267,657 |
| Comanche | Frolic | H. M. Hanna | 115,000 |
| Illinois | Supply | International Nav. Co | 325,000 |
| Kingston | Caesar | John Holman & Sons | 175,194 |
| Dorothea | Dorothea | Thos. McKean estate | 187,500 |
| Gov. Russell | Gov. Russell | City of Boston | 71,000 |
| East Boston | East Boston | City of Boston | 57,500 |
| W. H. Brown | Piscataqua | W. H. Brown | 130,000 |
| J. D. Jones | Apache | Merritt & Chapman | 54,510 |
| Celtic King | Celtic | Federal Line | 340,900 |
| Rhaetia | Cassius | William Lamb | 160,594 |
| A. W. Booth | Massasoit | Moran Towing Co | 30,000 |
| Joseph Holland | Hannibal | Francis Stanley Holland | 147,941 |
| Atala | Alexander | New Star Blue Line | 206,826 |
| Eliza Holland | Leonidas | Francis Stanley Holland | 147,941 |
| Harlech | Pompey | Jas. & Chas. Harrison | 111,929 |
| Abarenda | Abarenda | J. Graham | 175,000 |
| (Not known) | Scipio | Geo. P. Walford | 85,769 |
| Peter Jebsen | Brutus | L. F. Chapman & Co | 215,000 |
| No. 55 | Water Bg No 1 | Standard Oil Co | 24,000 |
| Whitgrift | Nero | McCondray & Co | 215,000 |
| Norse King | Rainbow | Thomas Ronaldson | 176,576 |
| Enquirer | Enquirer | W. J. Conners | 80,000 |
| Inca | Inca | Frank B. McQuesten | 35,000 |
| Huntress | Huntress | F. C. Fowler | 27,500 |
| Stranger | Stranger | Mrs. Mary Lewis | 75,000 |
| Kate Jones | Seminole | Boston Towboat Co | 25,000 |
| Bristol | Cheyenne | J. J. Cummings | 20,000 |
| Eugenia | Siren | J. G. Cassatt | 40,000 |
| Elfrida | Elfrida | Dr. Seward Webb | 50,000 |
| No. 295 | Sylph | John Roach & Co | 50,000 |
| Shearwater | Shearwater | Henry R. Walcot | 26,000 |
| Sylvia | Sylvia | Edward M. Brown | 25,000 |
| Hercules | Chickasaw | M. Revel | 15,000 |
| Confidence | Waban | M. Revel | 20,000 |
| Kanawa | Kanawa | John P. Duncan | 50,000 |
| Pedro | Hector | A prize capture | 200,000 |
| Port Chalmers | Glacier | Federal Line (London.) | 340,550 |
| Titania | Marcellus | William Lamb | 90,000 |
| Refrigerating ship | | | 247,704 |
| Lucilene | Arethusa | Thos. S. Hopkins | 218,992 |

The City of Pekin was chartered from the Pacific Mail Steamship Co. at $1,000 a day for the transportation of supplies from San Francisco to Manilla; also four steamships of the International Navigation Co. were chartered—the St. Paul, St. Louis, New York (renamed the Harvard) and the Paris (renamed the Yale)—at $2,500 a day each for the first two, and $2,000 a day each for the last two. These four steamships were, at the request of the war department, turned over to it, to meet its necessities in the way of transporting troops—the Yale for sixty-five days, the Harvard for twelve days, the St. Louis for twenty-eight days, and the St. Paul for forty-eight days. The city of Philadelphia loaned to the navy department for the nominal sum of $1, its ice-boat No. 3, renamed the Arctic.

"In view of the difficulties which have been encountered in the transportation of troops by sea in the recent war, it is recommended that the transport service be put under the control of the navy department. The recent experiences in the convoying of troops from Tampa to Santiago de Cuba, and from San Francisco to the Phillipine Islands, and the landing of troops and supplies, make it evident that we should follow the universal practice in foreign countries of placing this work in the hands of naval officers. To make the transport service efficient it must necessarily be carried on vessels large enough to carry a complete infantry regiment, with all accountrements, arms, ammunition, supplies, etc., landing at their destination in as good or better condition than when received on board. It is believed that this can best be accomplished by placing the responsibility in the hands of people who are accustomed to handling and caring for large bodies of men on board ship. If this recommendation commends itself to congress provision should be made for the construction of two transports, one for the Atlantic and one for the Pacific coast."

## TRADE NOTES.

Thomas Hall & Son, Boston, manufacturers of the megaphone which bears their name, have removed their office and sales room from 17 Bromfield street to 79 Franklin street, where their workshops have been located for some time past.

Four large electric fans, having a combined capacity of 134,000 cubic feet of air per minute, have recently been set up in connection with the Boston Subway, for the purpose of securing the necessary ventilation. They were designed, constructed and installed by the B. F. Sturtevant Co., of Boston, Mass.

The Berlin Iron Bridge Co., of East Berlin, Conn., is erecting for the Waterbury Mfg. Co., at Waterbury, Conn., a new blacksmith shop two stories high. The building is to be of fireproof construction throughout. The floor consists of concrete on corrugated iron arches, carried by steel beams and columns. The roof has steel trusses supporting the covering of corrugated iron lined with the Berlin company's patent anti-condensation lining.

"Enclosed Arc Lamps" is the title of the latest pamphlet issued from the General Electric Co.'s press. It deals with the different types of enclosed arc lamps manufactured by that company for direct and alternating current circuits, indoor and outdoor lamps, marine lamps, miniature lamps, power circuit lamps, series enclosed lamps and single-globe and double-globe lamps. Each type is well illustrated, and the object of its design and its advantages set forth in language unhampered by abstruse technical expressions. It is written for the information of the general consumer as well as the electrician. Printing and illustrations are, as usual, excellent. The pamphlet will be sent to persons interested on application to any of the sales offices of the General Electric Co.

## YUKON RIVER STEAMERS.

A NEW PICTURE OF THE VESSELS RECENTLY CONSTRUCTED BY THE MORAN BROS. CO., SEATTLE, AND DELIVERED AT ST. MICHAEL.

Mr. Robert Moran of the Moran Bros. Co., Seattle, Wash., builders of steel and wooden ships, recently surprised the shipping world by delivering at St. Michael, in Alaska, a fleet of twelve light-draught wooden steamers designed for the Yukon river service. In view of the number of vessels of greater length and draught which have been lost during the past season while attempting this passage, the feat is certainly remarkable and speaks well for the staunchness of conscruction of the vessels. Through the courtesy of Mr. Moran the Review is enabled to present herewith the last picture of the vessels taken before they sailed for Alaska. Only seven of the twelve steamers are shown in the picture, which was taken at San Juan island, Puget Sound, from whence the fleet was cleared at the custom house for St. Michael.

The steamers—identical in every respect—are 175 feet in length, 35 feet beam, and 6½ feet depth of hold. They are stern wheelers, with engines having cylinders of 20 inches diameter and 7 feet stroke. Steam is supplied from three cylindrical tubular boilers, 44 inches in diameter by 16 feet long, with eighty-two 2½-inch tubes. The vessels are equipped with steam capstan, steam and hand steering gear, and a complete electric plant, including a 2,000 candle power searchlight in the pilot house. Each vessel has cabin accommodations for twenty-four passengers, and 200 more could be accommodated on deck should occasion require. The hold contains provision for the carrying of freight, and each vessel has a capacity of 400 tons on 48 inches draught. The hulls and all machinery, with the exception of the pumps and electrical installation, were built by the Moran Bros. Co.

YUKON RIVER STEAMERS, BUILT BY MORAN BROS. CO. AT SEATTLE, WASH.

The Bethlehem Iron Co. seems as proud of the performance of the torpedo boat Davis as the builders of the vessel, the Wolf & Zwicker Iron Works, Portland, Ore. The Bethlehem company furnished engine forgings and shafting for this vessel. On her trial of two hours the Davis made an average speed of 23½ knots. This was one knot more than contract speed. Revolutions averaged 382.

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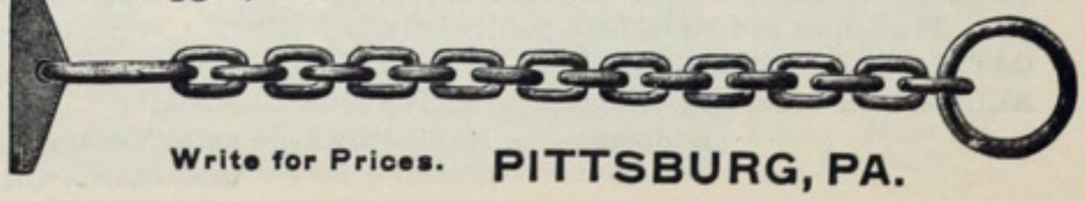

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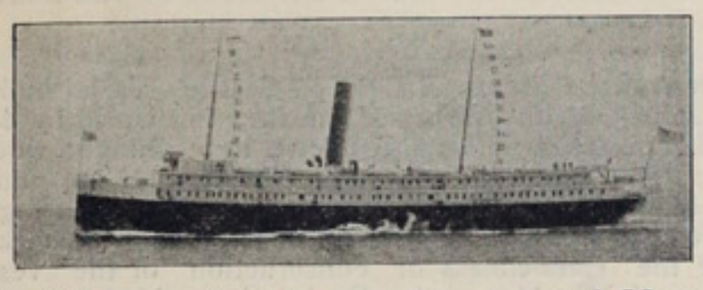

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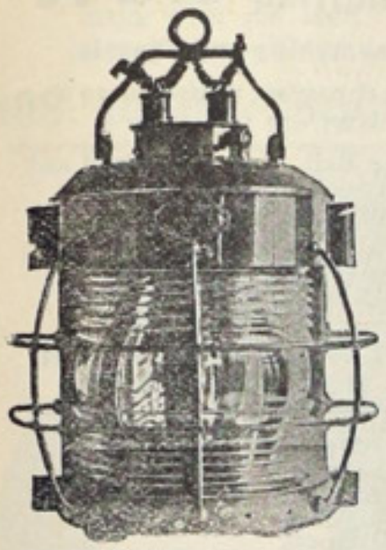

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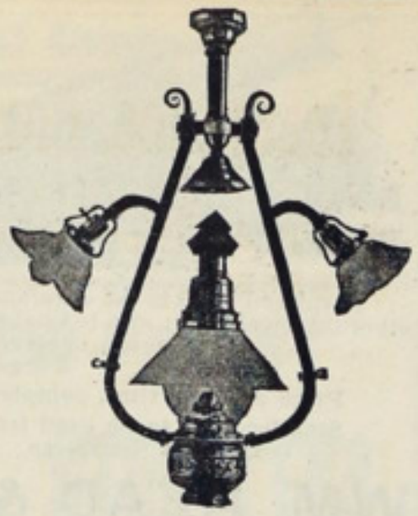

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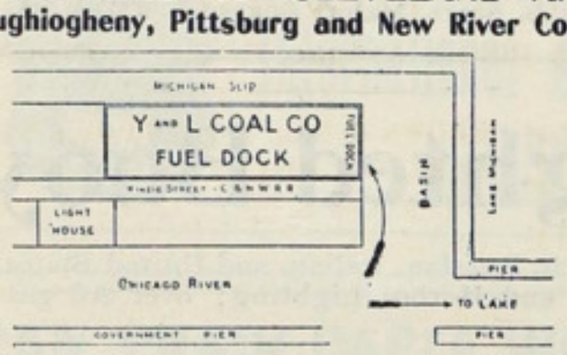


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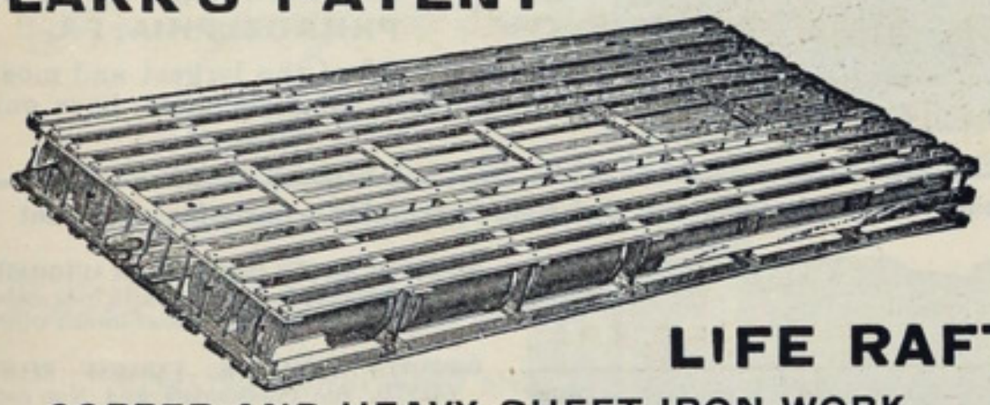

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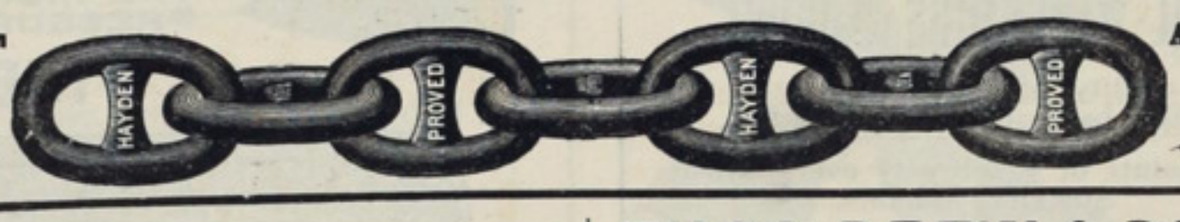


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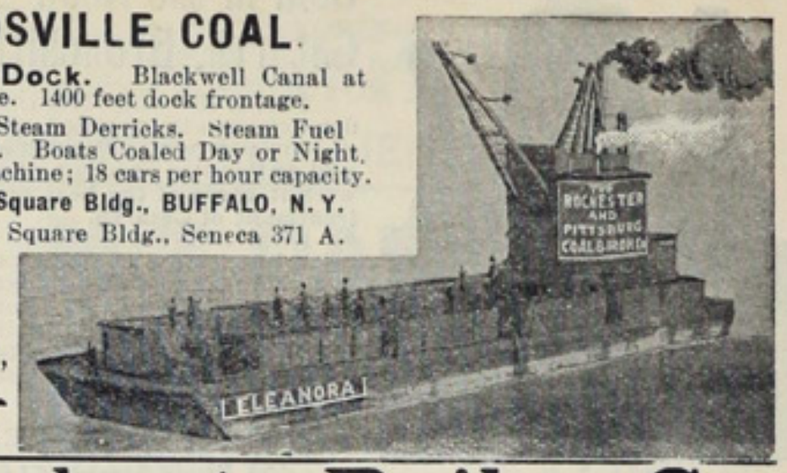


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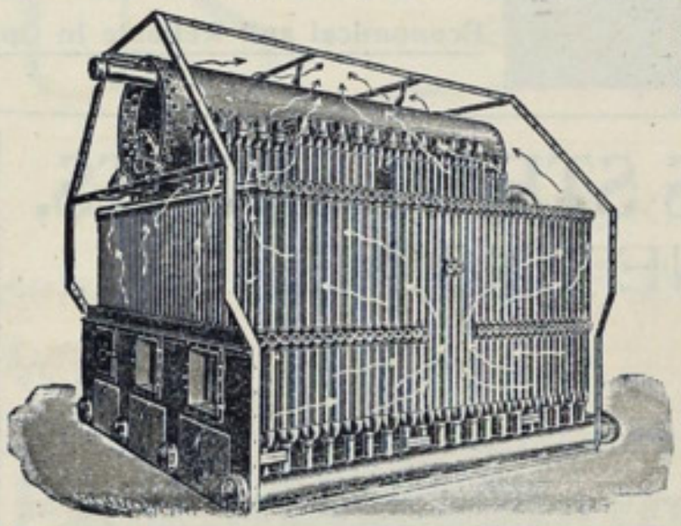

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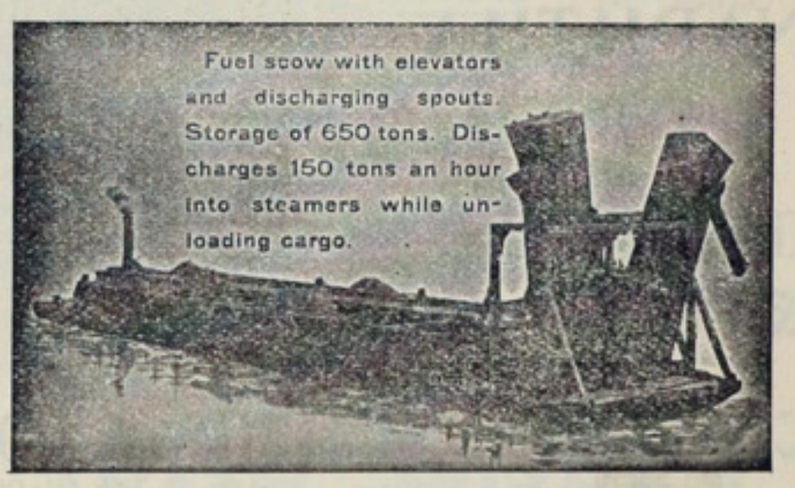
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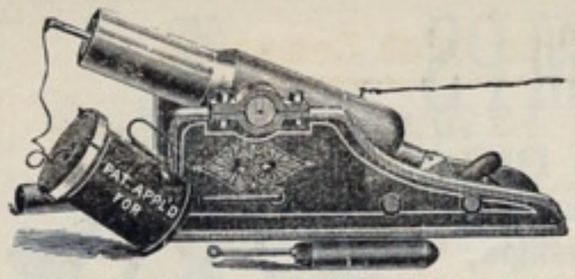


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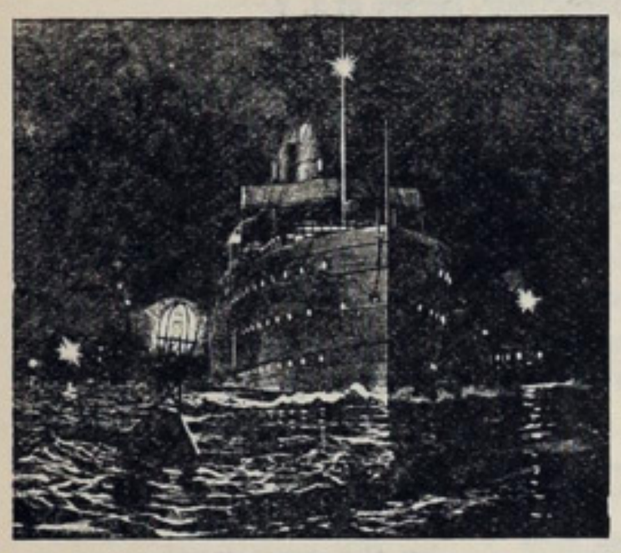

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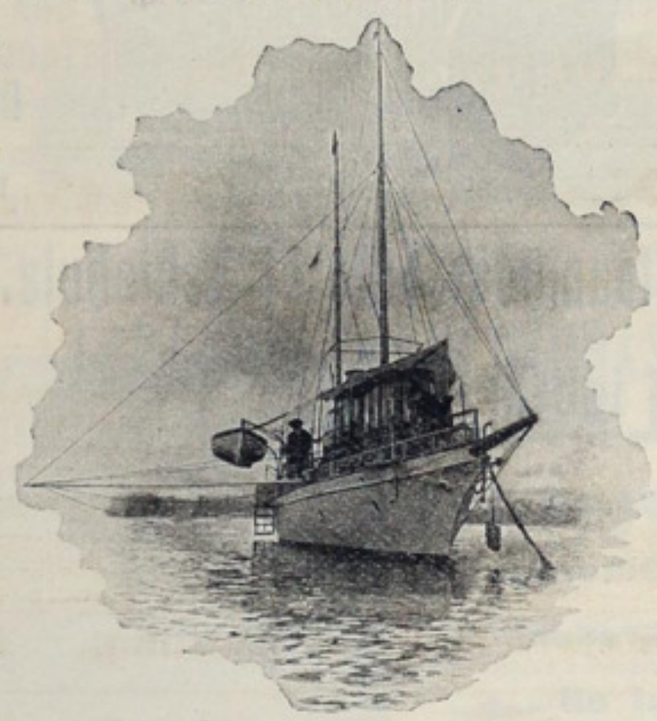

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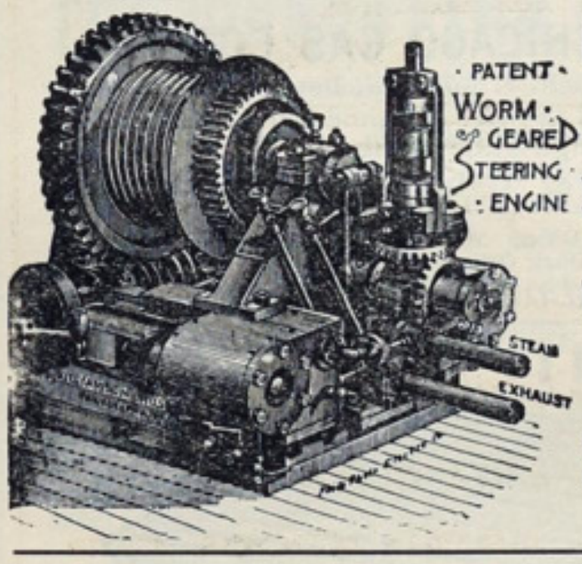


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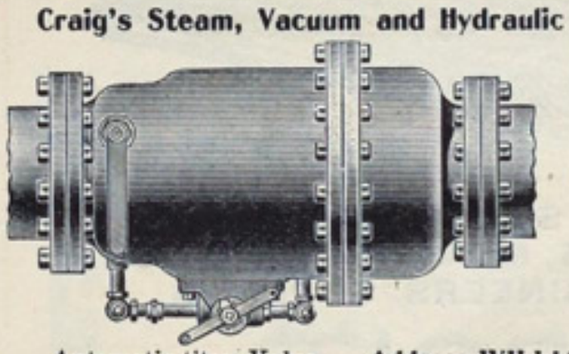

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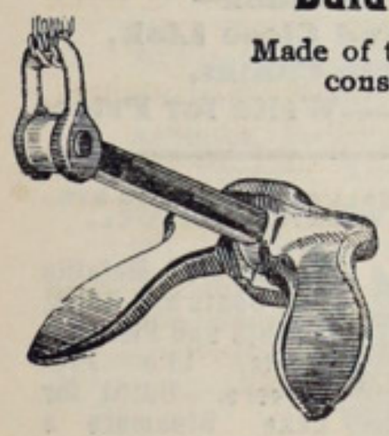

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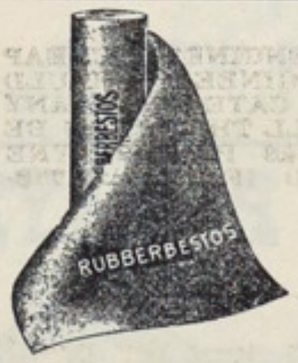


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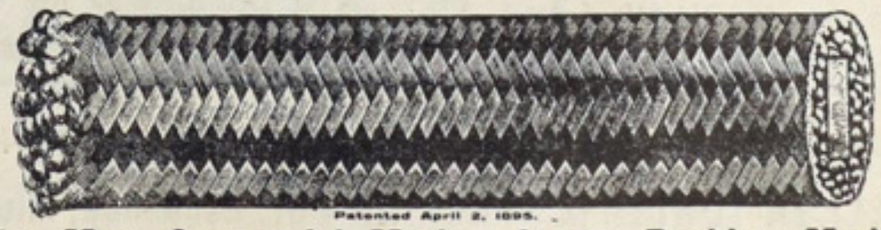

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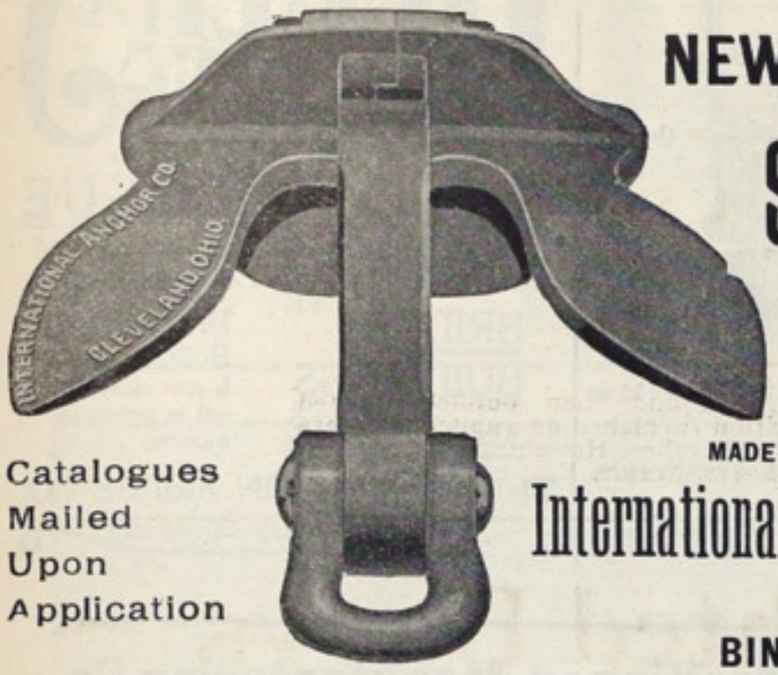


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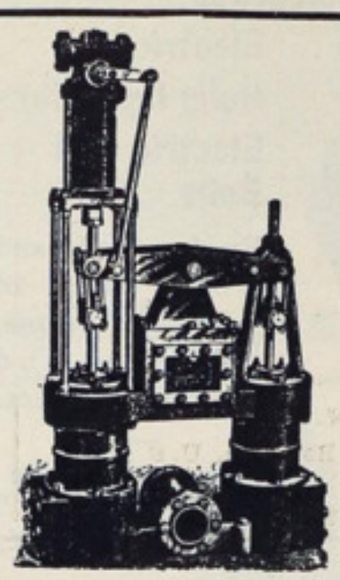

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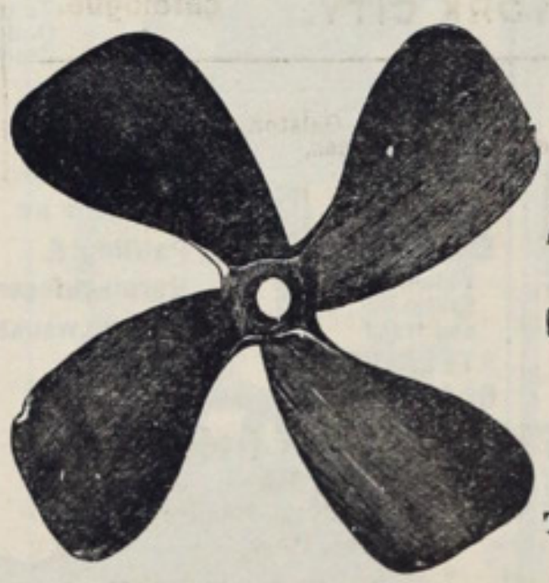

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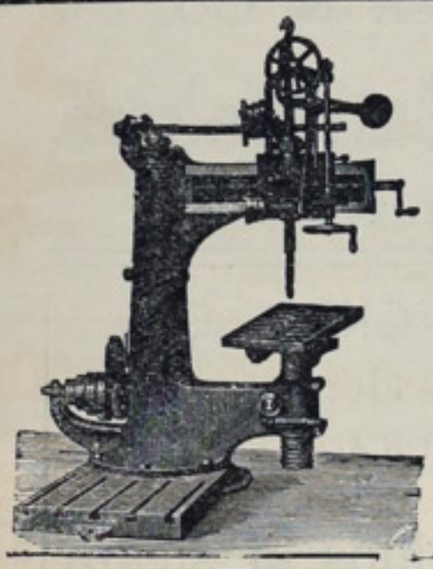

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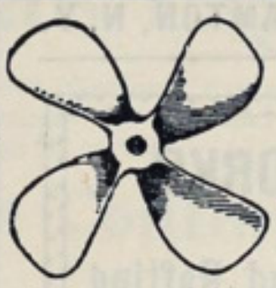

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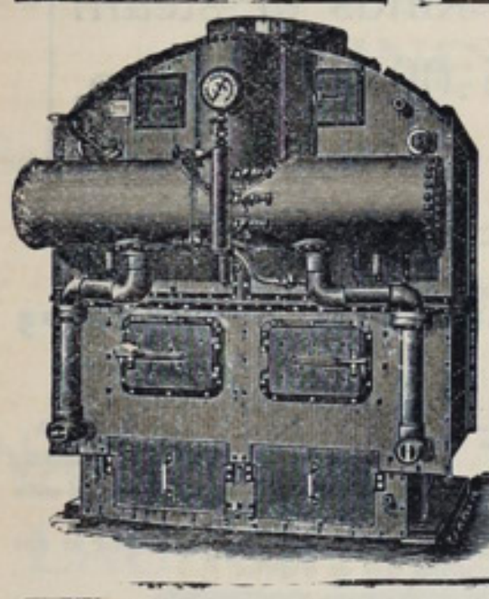

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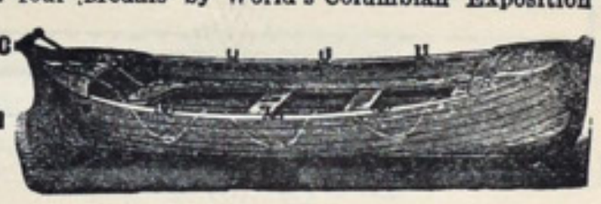

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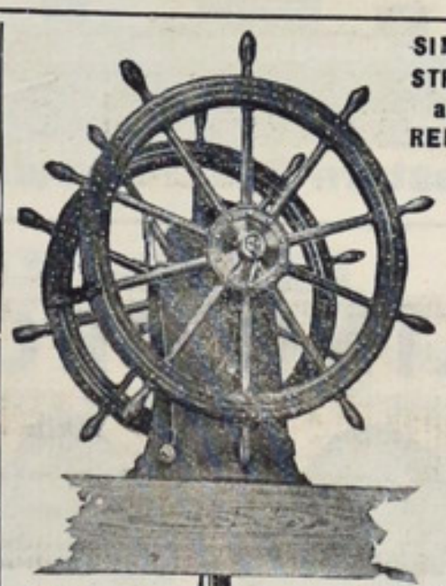

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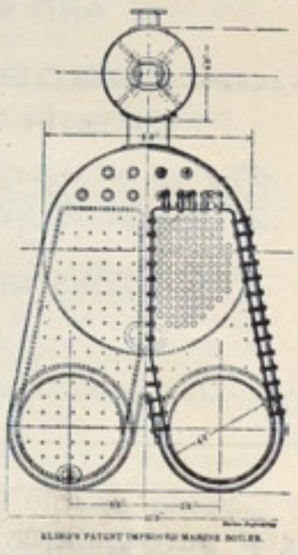

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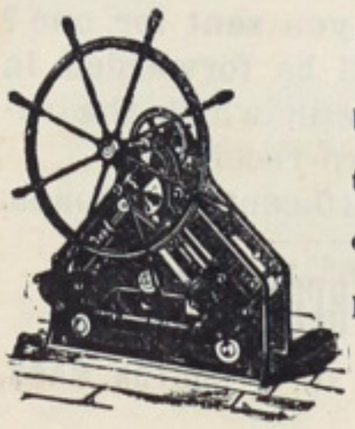

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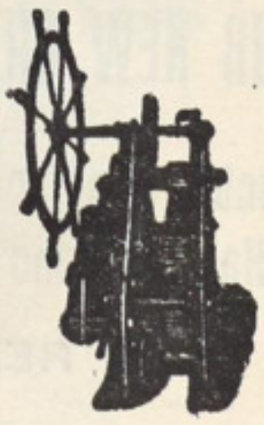

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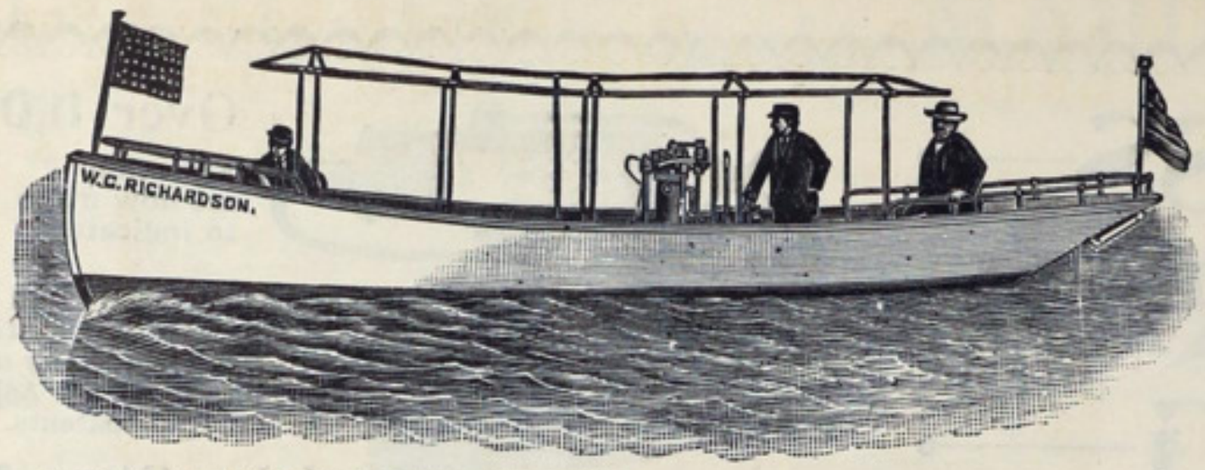


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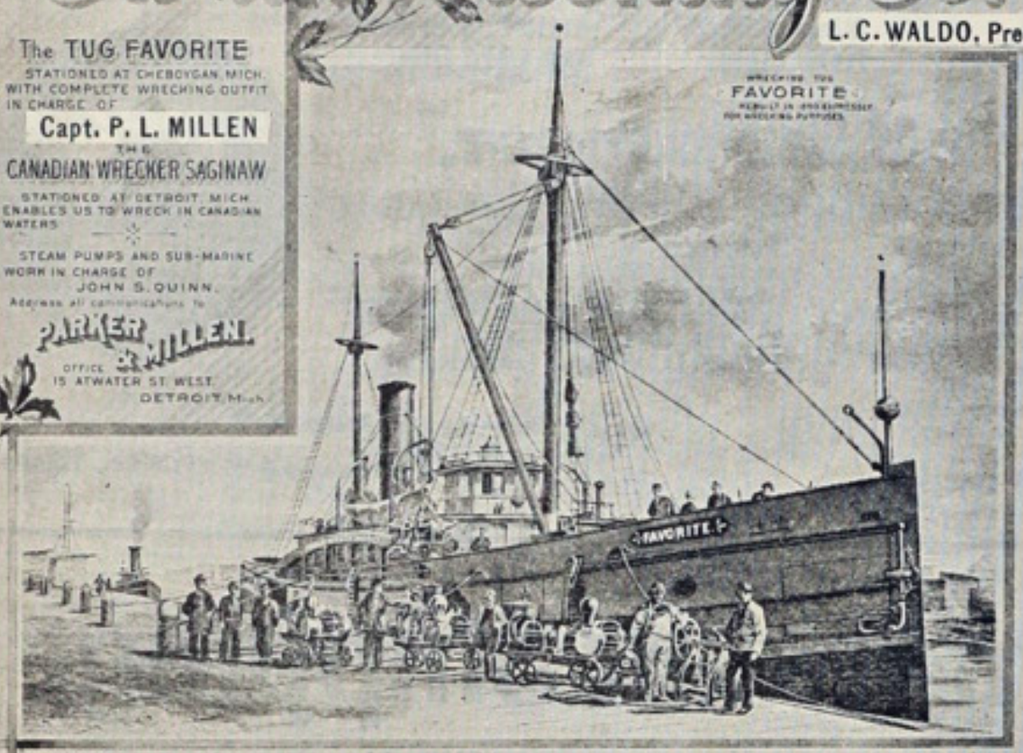


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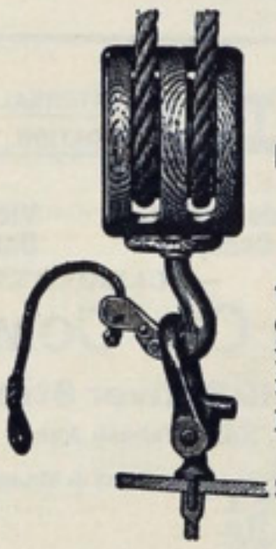

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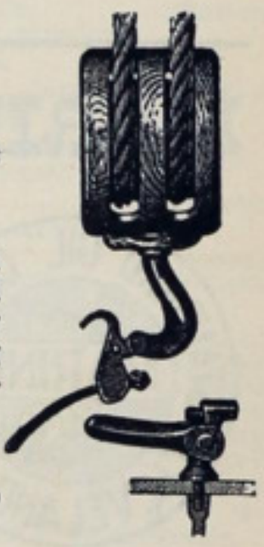

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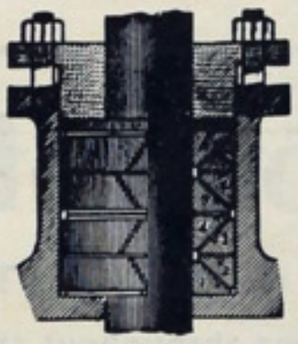

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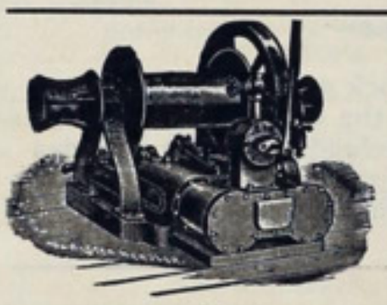

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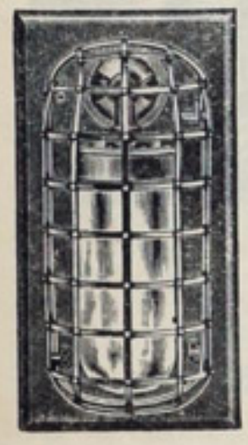

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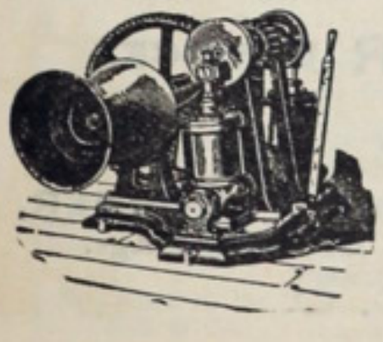

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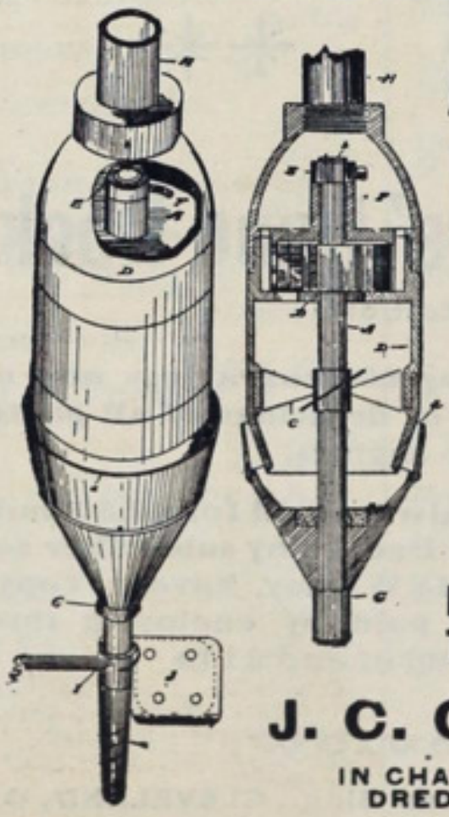

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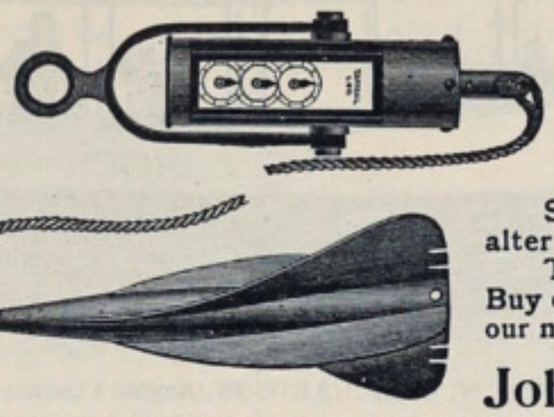

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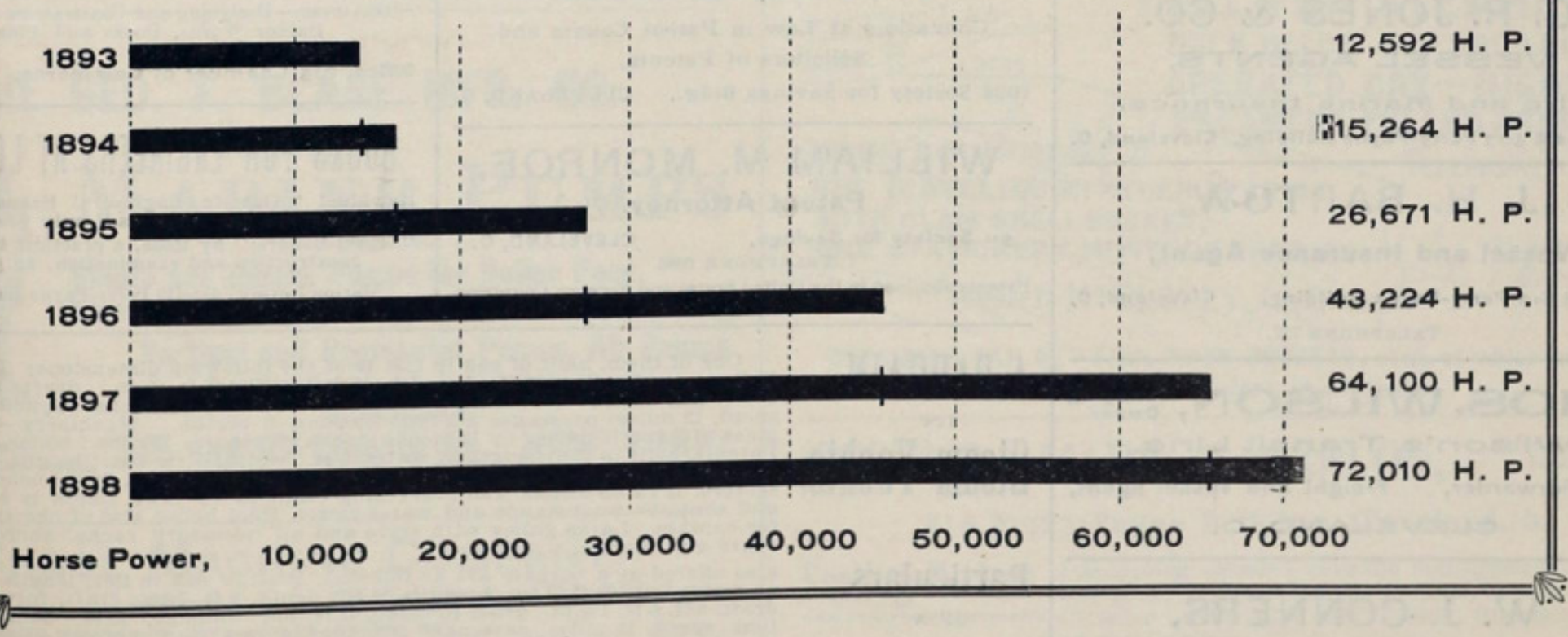
Diagram showing Increase of Howden Equipment by Dry Dock Engine Works, Detroit.

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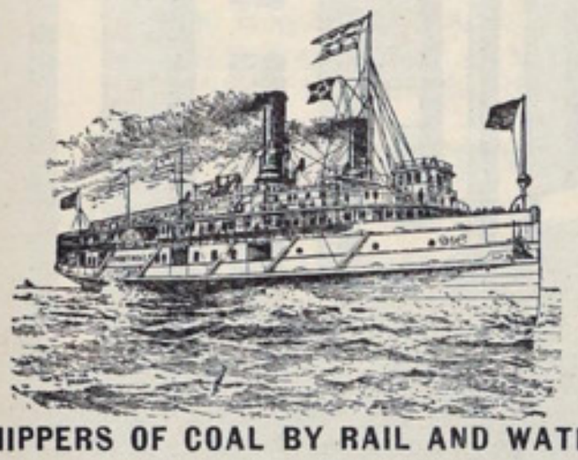

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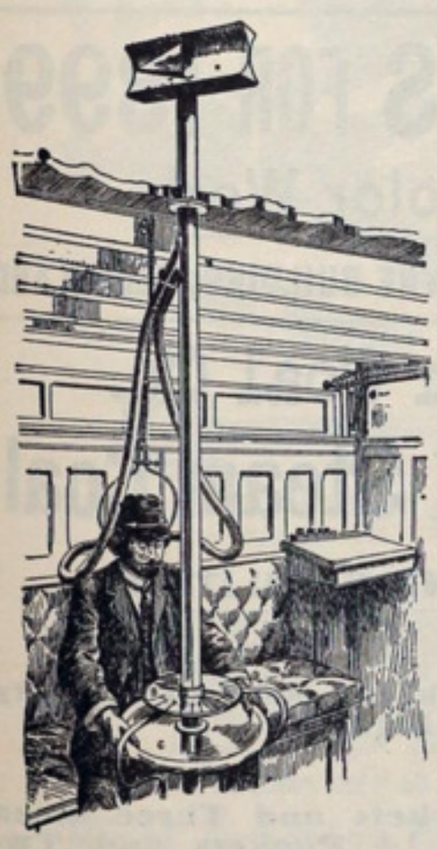

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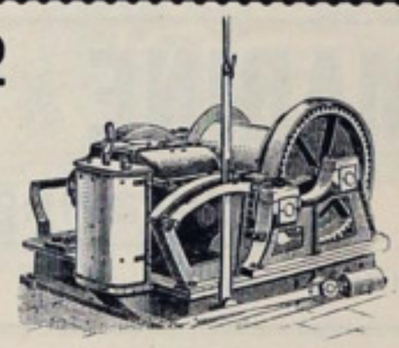

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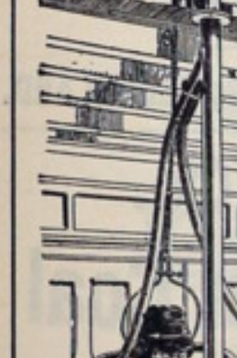

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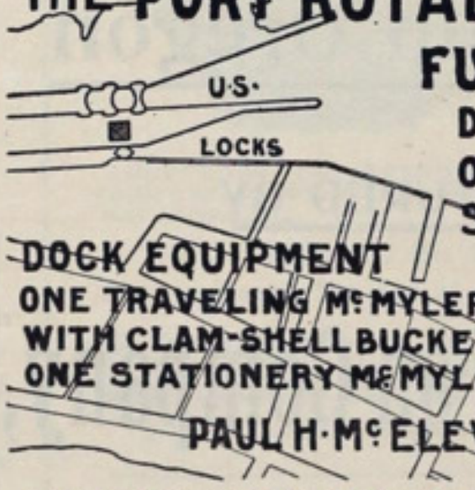


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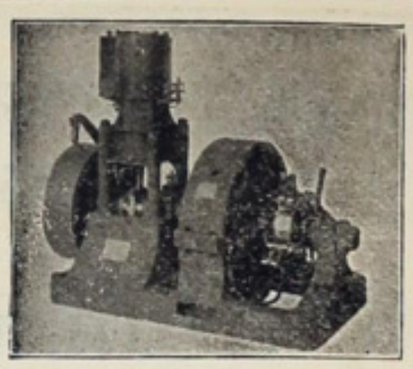

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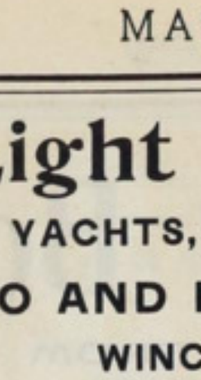

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**After 20.000 miles of almost continuous steaming since going into commission, including her remarkable trip from San Francisco to Key West, the U. S. Gunboat MARIETTA, equipped with Babcock & Wilcox water tube boilers, ordered the following repair parts:**

"T. B. S.—W. D. L. NAVY DEPARTMENT, In reply refer to No. 29181.
Bureau of Supplies and Accounts,
Washington, D. C. June 10, 1898.

Gentlemen:

1. Please forward to the Commanding Officer, U. S. S. 'MARIETTA', Key West, Fla., 8 fire bricks, 4 rights and 4 lefts, No. R, 3440, Babcock & Wilcox boilers, to replace broken bricks between furnace doors.
2. Your bill for these articles should be sent to the same officer and should refer to Steam Engineering Requisition dated June 1, 1898.

Respectfully,
(Sig.) EDWIN STEWART, Paymaster General, U. S. N.

THE BABCOCK & WILCOX CO.,
29 Cortlandt St., New York."

**On her long voyage the MARIETTA was not detained an instant on account of boilers.**

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IRON OR STEEL FORGINGS FINISHED COMPLETE, ROUGH MACHINED OR SMOOTH FORGED ONLY, OF ANY WEIGHT.
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**STEEL and METAL SHIPS**

Of all classss built on the Shortest Possible Notice at our yards at

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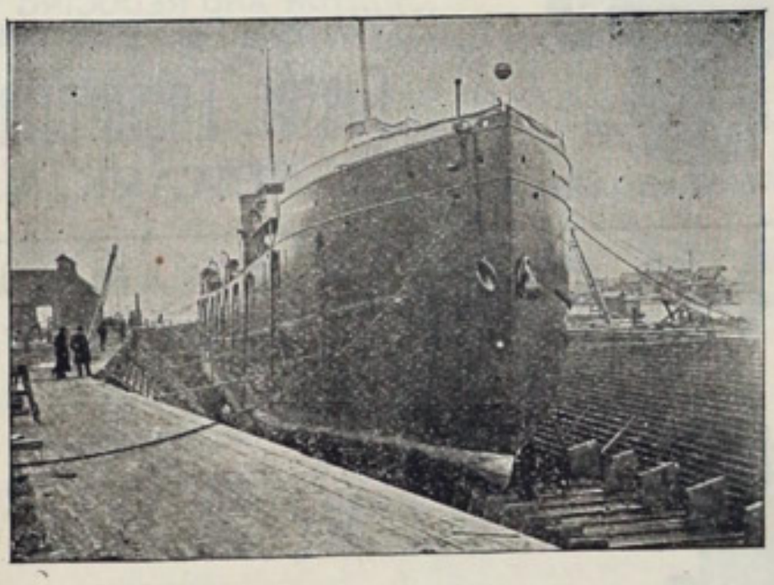
**Plates & Material Always on hand to Repair all kinds of Metal Ships in Shortest Time.**



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**SIZE OF DOCK.**

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| Length, extreme | 537 feet. | Entrance, Top | 55 feet 9 in |
| Breadth, Top | 90 " 4 in. | Entrance, Bottom | 50 " |
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**Prices for Repairs and Docking same as at lower lake ports**

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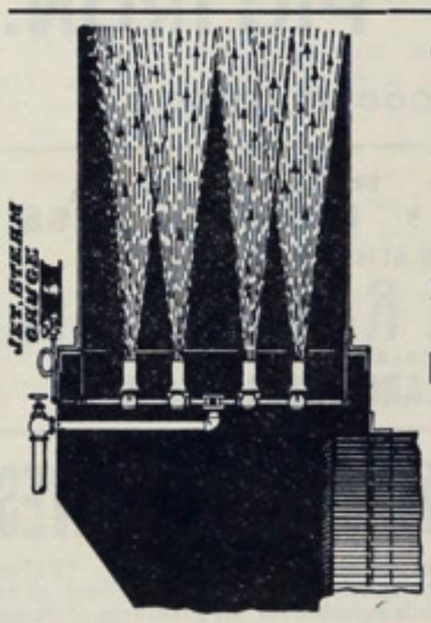


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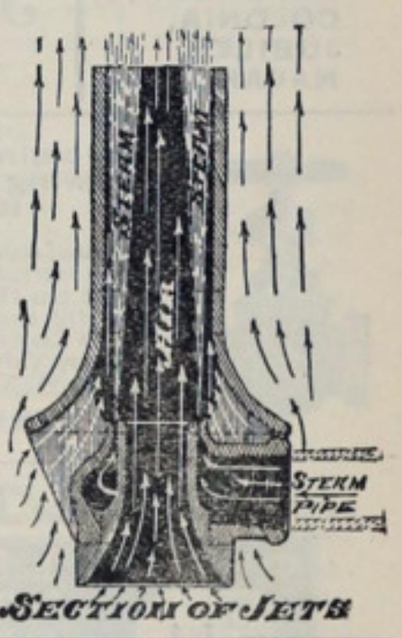
**15% TO 25% INCREASE IN POWER.**




SECTION OF JETS

Cut on the right shows a section of Jet Castings, which are attached to Spider in stack, as shown by cut on the left.

**Requires No Attention.**
**Always Ready for Use at a Moment's Notice.**

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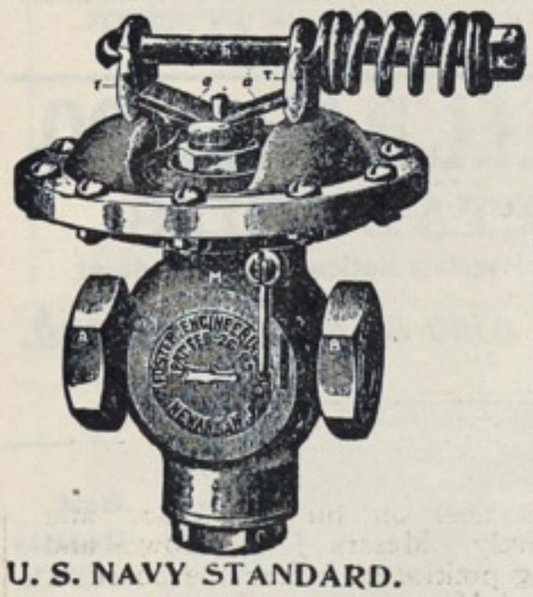

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The Experimental Board of the Bureau of Steam Engineering of the U. S. Navy, after recent tests, report that it is:

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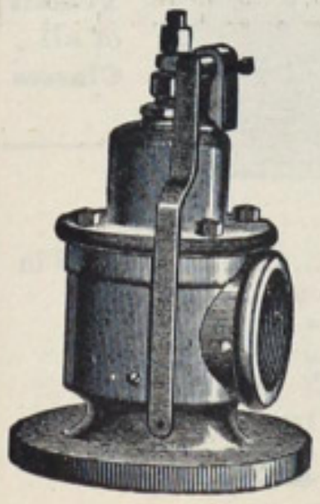

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